

作成承認印

配布許可印



# AF VR Zoom-Nikkor ED 80-400mm/f4.5-5.6D

## REPAIR MANUAL

**Nikon** | NIKON CORPORATION  
Tokyo, Japan

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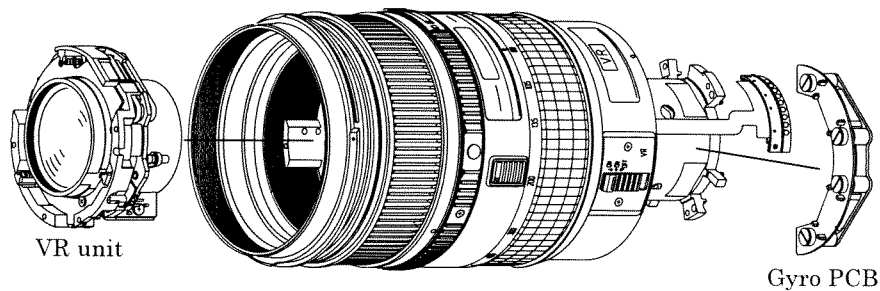
無断転載を禁ず !!

## ※BEFORE DISASSEMBLING, DISASSEMBLING AND ADJUSTING

- ① This lens loads the VR (Vibration Reduction) unit to perform the vibration reduction function.

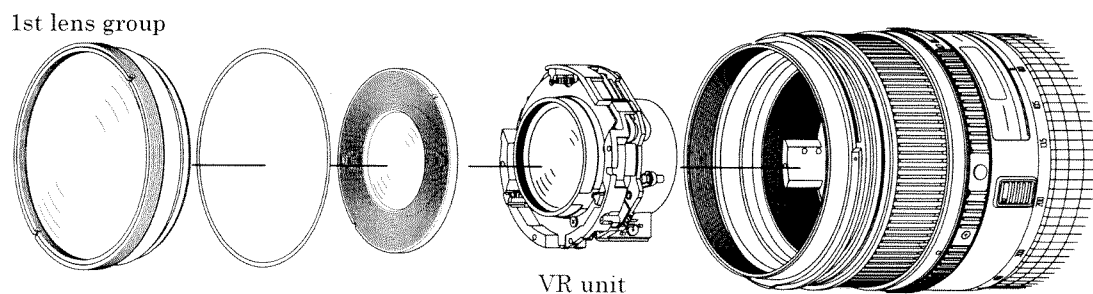
To maintain the accuracy of the vibration reduction function, be sure to perform the VR adjustment by using the VR lens adjustment equipment (J15380) when removing the VR unit and Gyro PCB.

However, the VR adjustment is not necessary when disassembling the other parts.



- ② The optical axis between the 1st lens group and the VR unit has been adjusted so that the optical axis would not dislocate when the 1st group lens injects at zooming operation.

When replacing the 1st lens group or removing the VR unit, it is necessary to adjust the optical axis by using the auto collimator and the special tool.



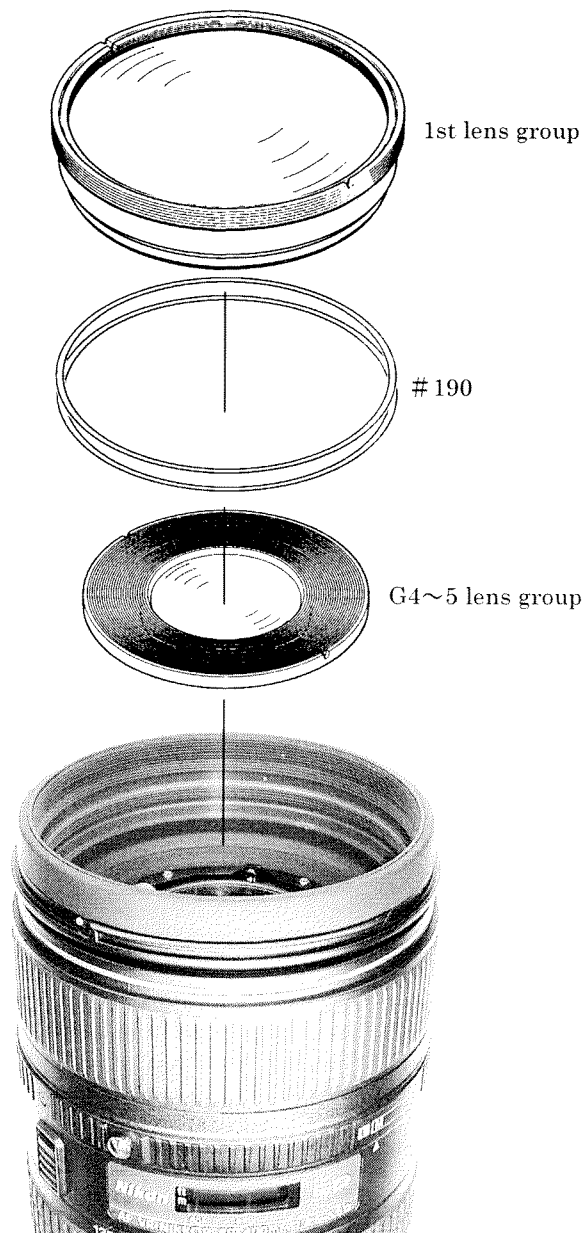
At the service facilities where [VR lens adjustment equipment] and [ Auto Collimator and Special Tool] are not set up, do not repair or disassemble the product applicable to the above.

# DISASSEMBLING/ASSEMBLING/ADJUSTMENT

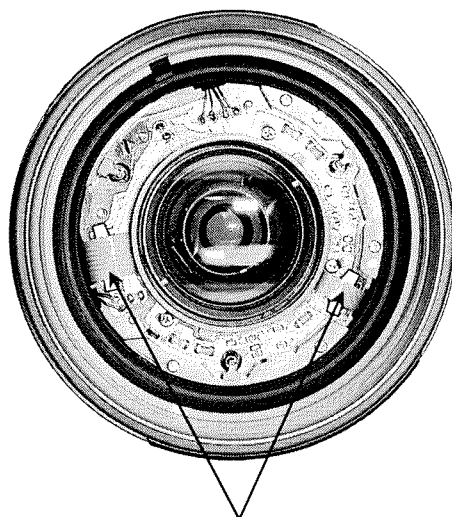
- Notes : ①Remove the tripod socket before disassembling.  
 ②Remember the condition how FPCs were mounted and how the codes were arranged when disassembling.  
 ③[DISASSEMBLING • ASSEMBLING • ADJUSTMENT] were made with using a trial product, therefore, its shape might be different from the product.  
 ④As the pictures were processed with the special method, its texture might be different from it of the actual thing.

## 1 . DISASSEMBLING

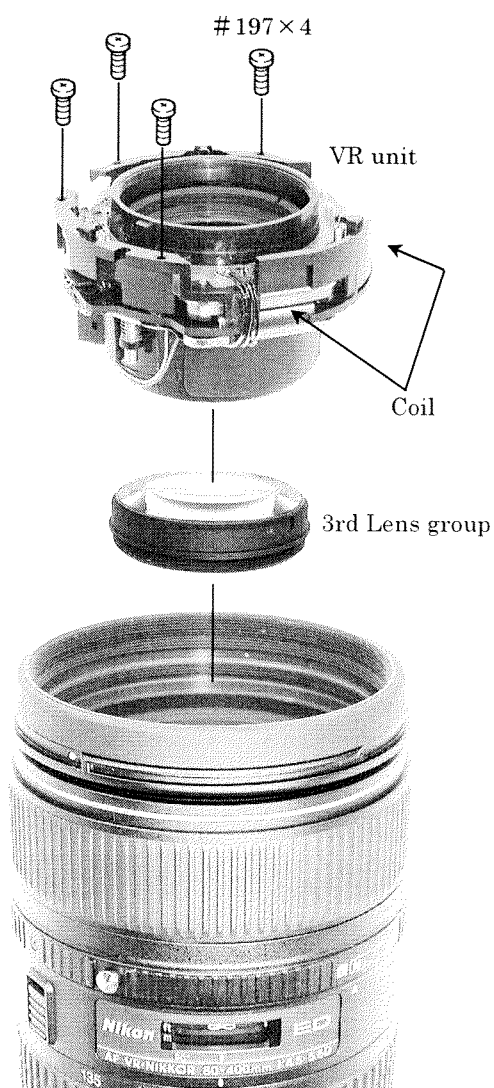
### FRONT LENS GROUP



## VR UNIT, 3rd LENS GROUP



Remove the FPC from the connector.



Notes :

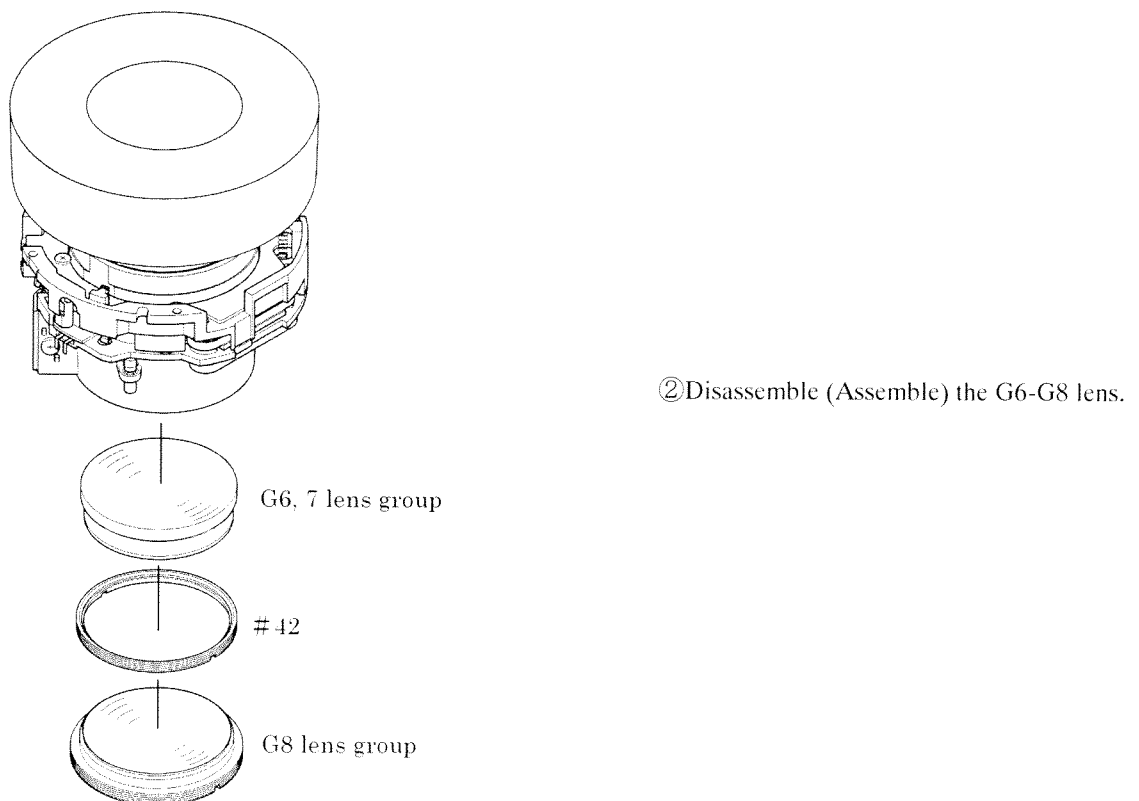
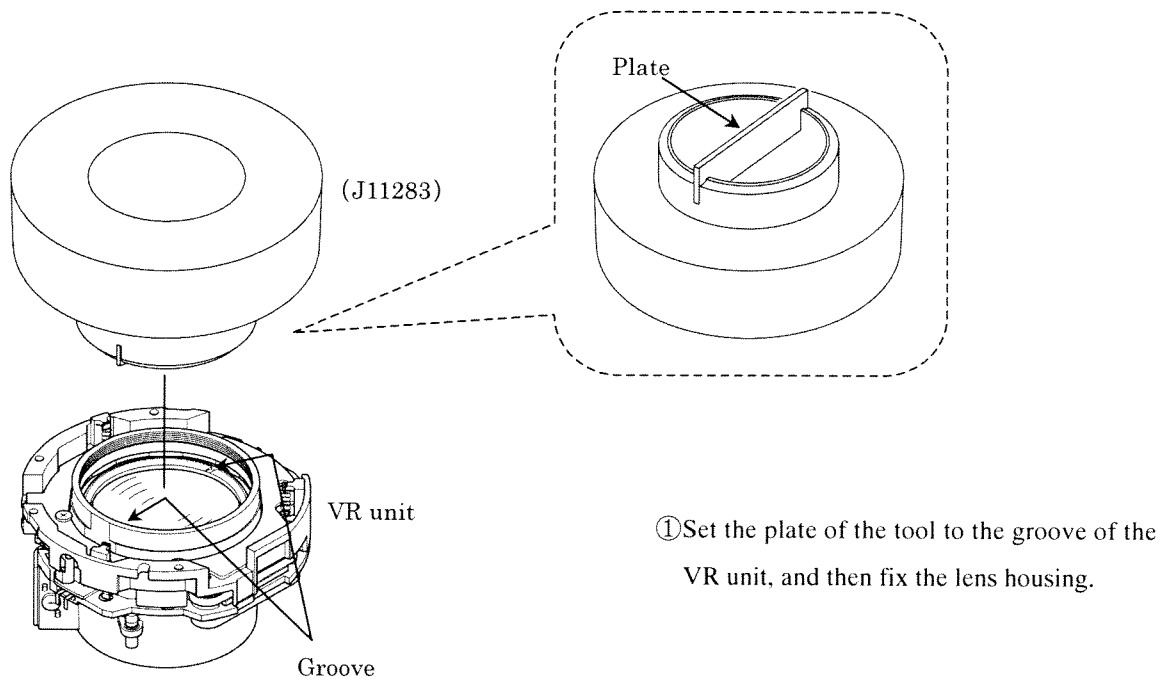
- ① Be careful that the VR unit cannot maintain its accuracy if receiving an impact and so on. The coil on the exterior of it is the magnet for the performance control. Do not mix a foreign substance that might be cause of the performance trouble in it.
- ② Use the exclusive tool when disassembling the lens in the VR unit.  
(Refer to the next page)



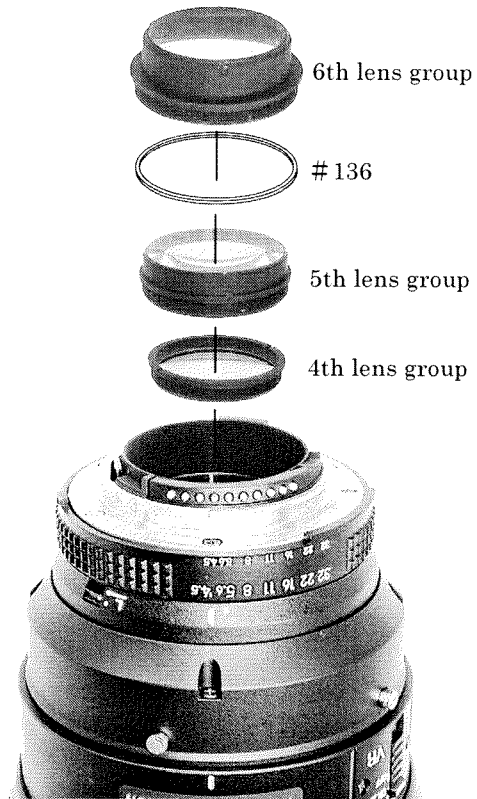
G6~G8 LENS GROUP

**Notes :** When disassembling or assembling the lens (G6-G8) of VR lens, be sure to use the exclusive tool (J11283), and work after fixing the lens housing in the VR unit.

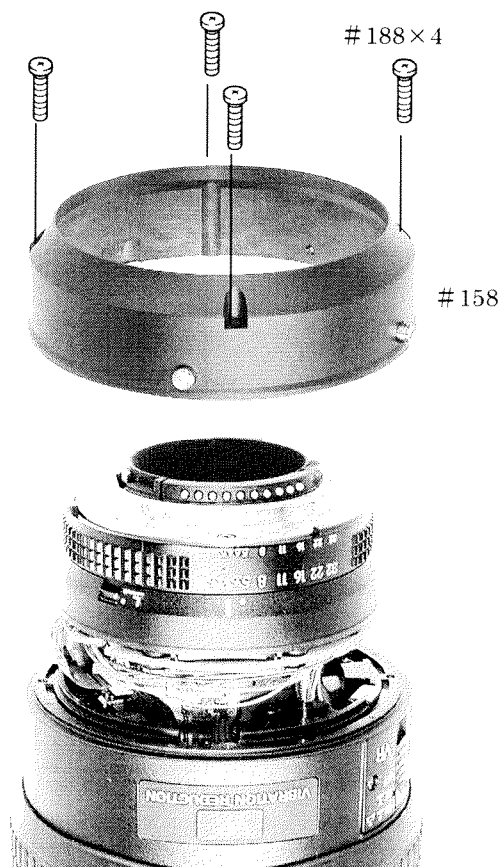
If working in the condition that the lens housing in the VR unit is not fixed, there is possibility of breakage or transformation and it comes to be impossible to maintain its accuracy.



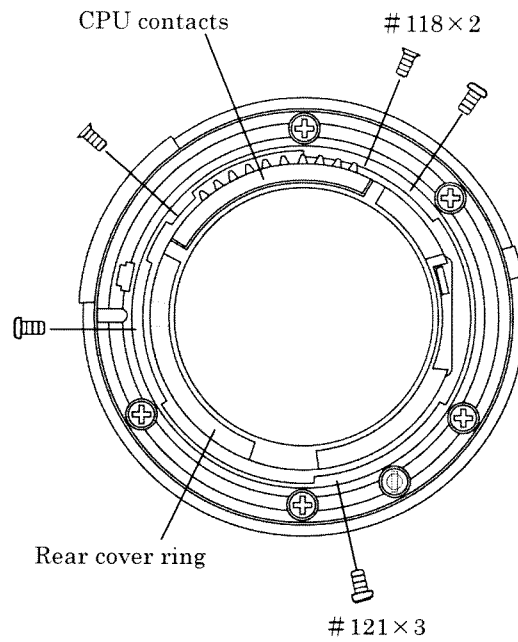
#### 4~6th LENS GROUP



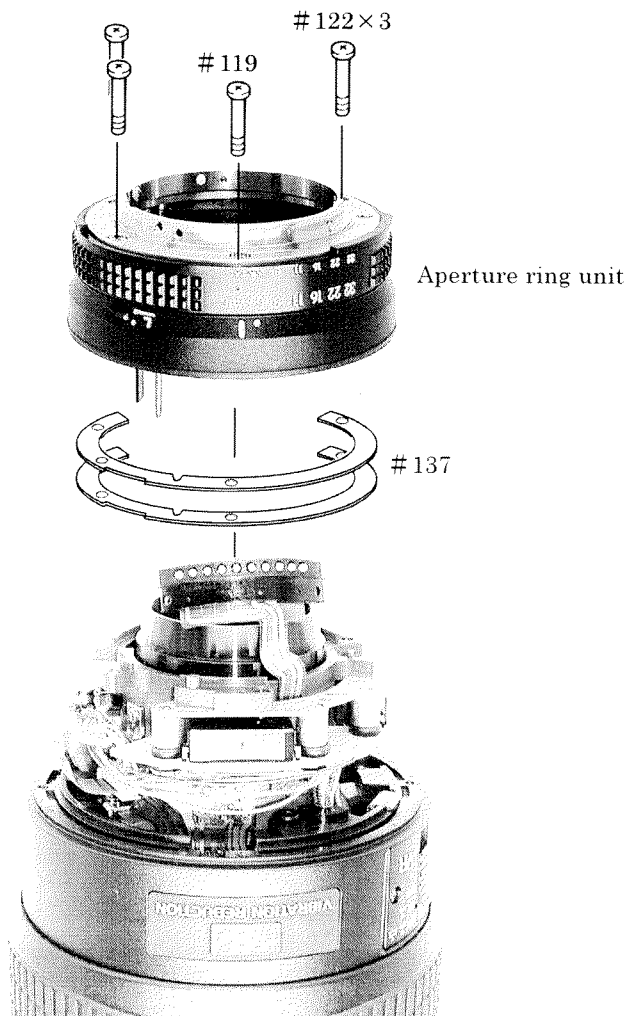
## RING # 158



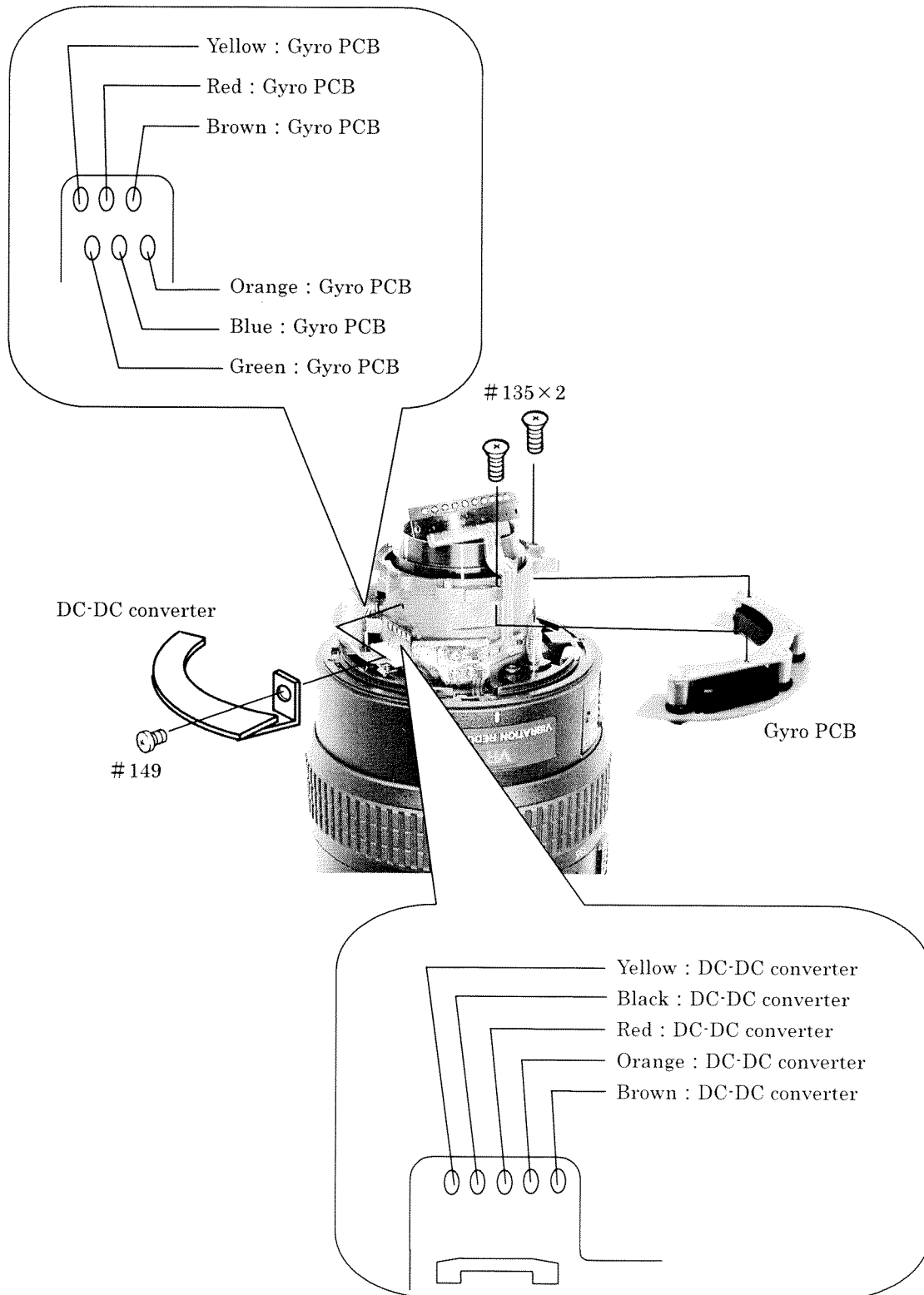
REAR COVER RING



APERTURE RING UNIT



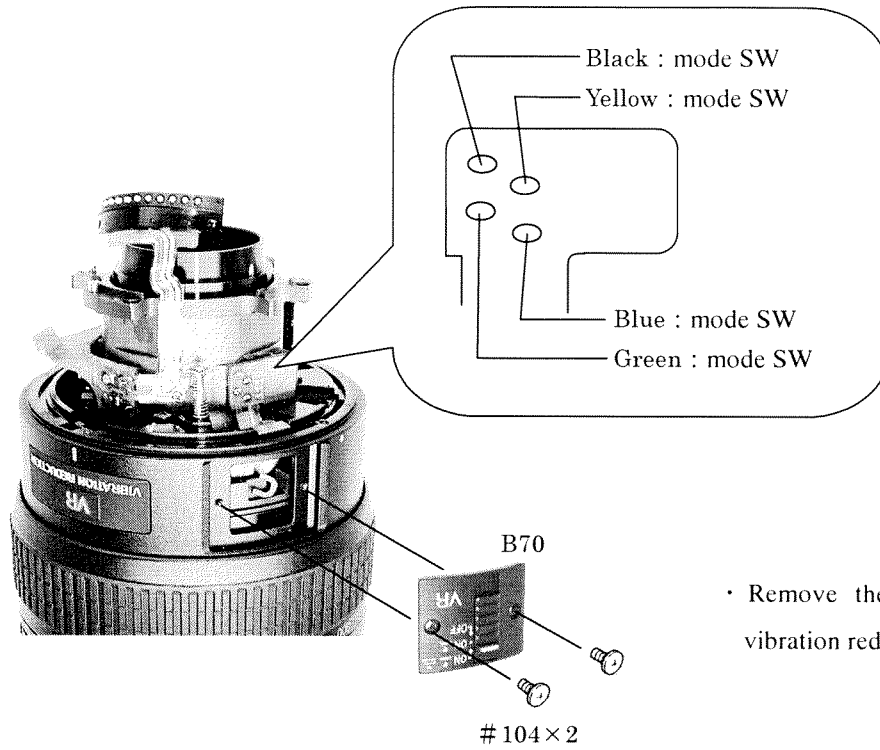
GYRO PCB, DC-DC CONVERTER



- Remove the above wiring, and then remove the gyro PCB and DC-DC converter.

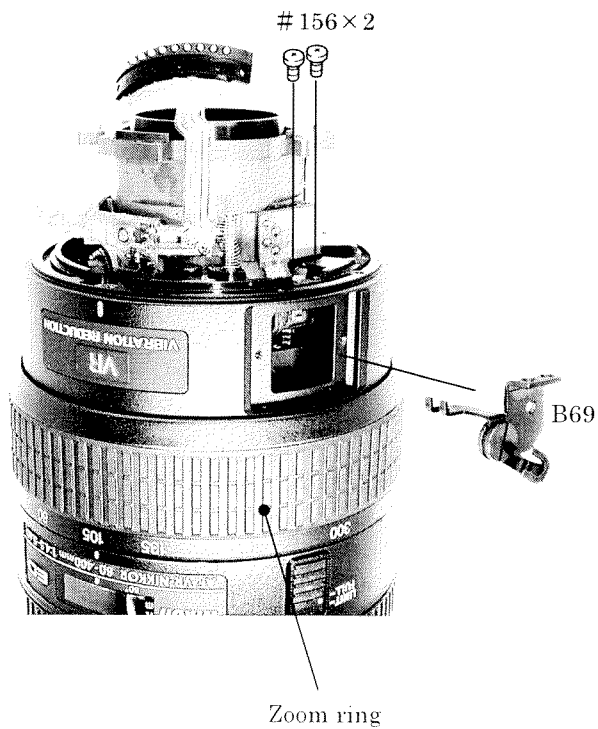
**Notes :** The gyro PCB unit has possibility that it cannot maintain its accuracy even with a little impact, therefore, handle it with care.

VIBRATION REDUCTION MODE SWITCH



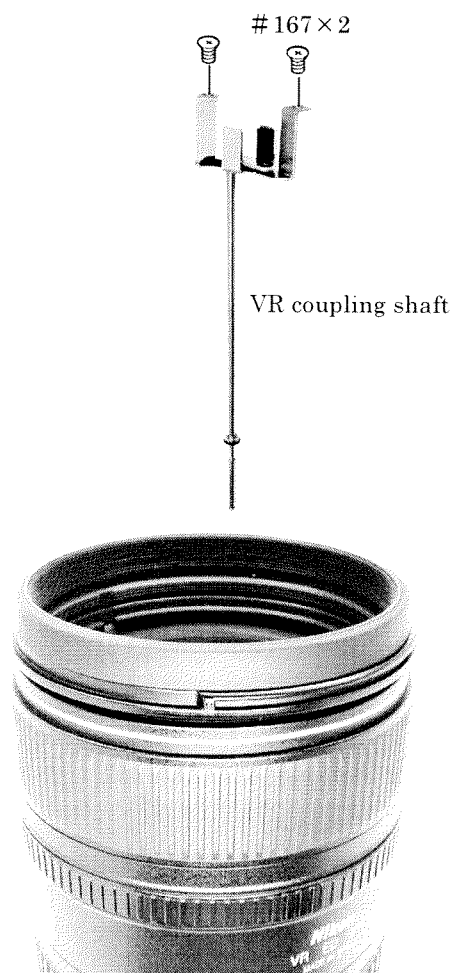
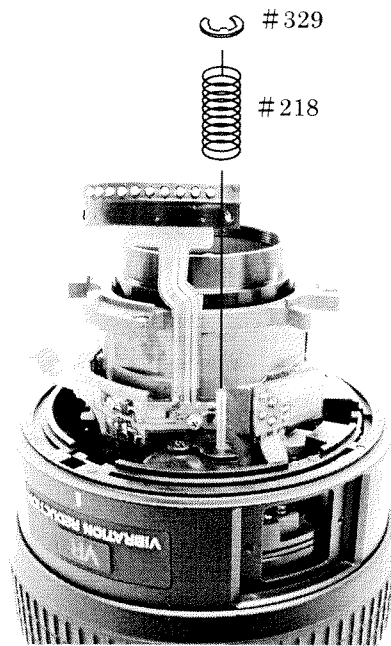
- Remove the wiring, and remove the vibration reduction mode SW.

SWITCHING LEVER

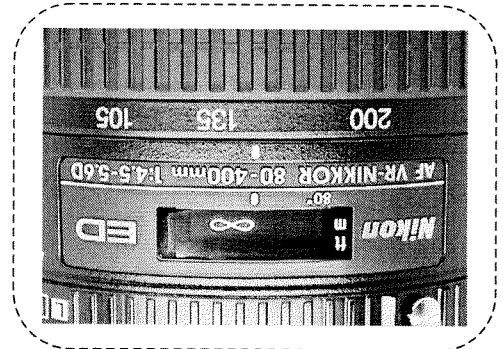
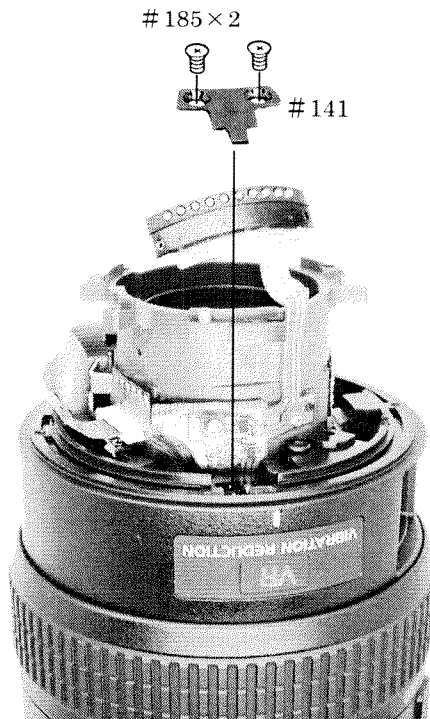


- ① Remove 2 pieces of screws #156.
- ② Rotate the zoom ring to set it to more than 105mm on TELE side.
- ③ Remove the switching lever B69.

VR COUPLING SHAFT

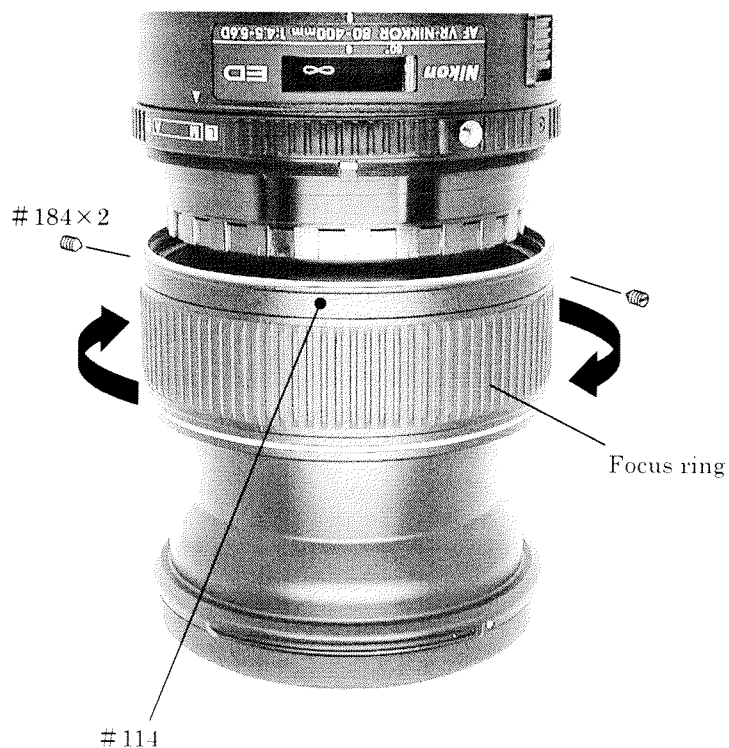


## ZOOM INTERLOCKING KEY



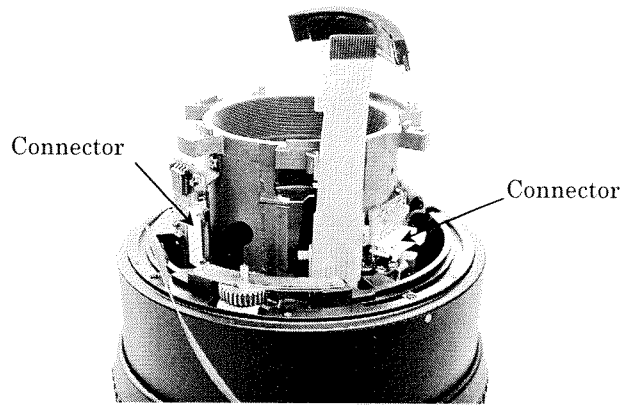
- The zoom interlocking key #141 can be removed at the position where the zoom ring is set near 135mm as shown in the above figure.

## DISASSEMBLE THE FOCUS RING

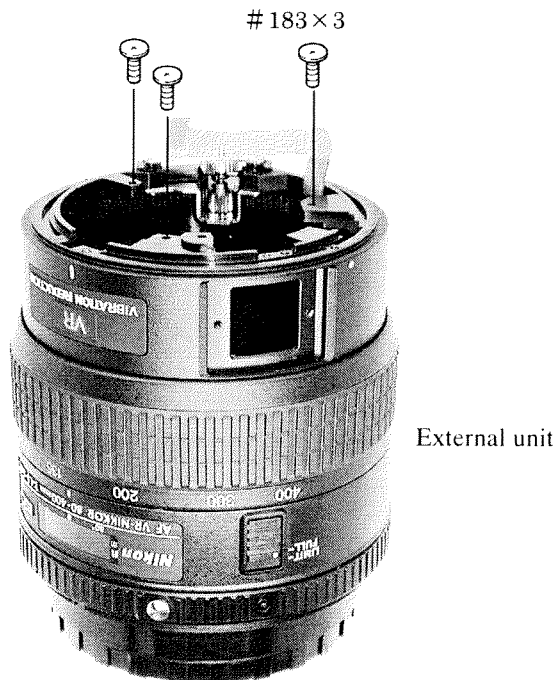


- Remove 2 pieces of screws #184 and rotate #144 in the arrow direction to disassemble the focus ring.

EXTERNAL UNIT

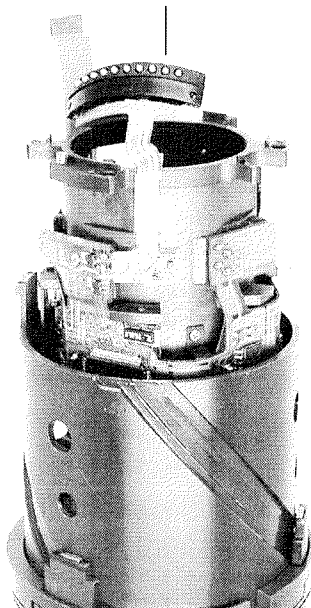


- ① Remove the FPC from 2 places of the connector.



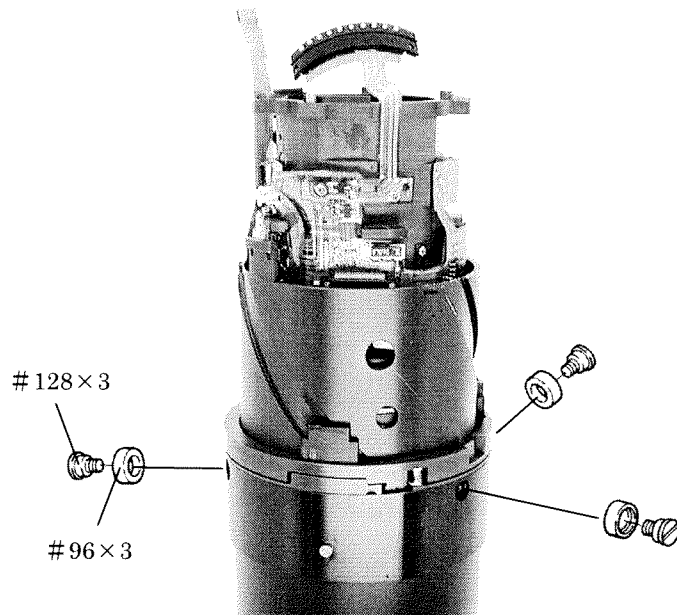
- ② Remove 3 pieces of screws #183 and remove the external unit.

Notes : When removing the external unit, do not cut each FPC.

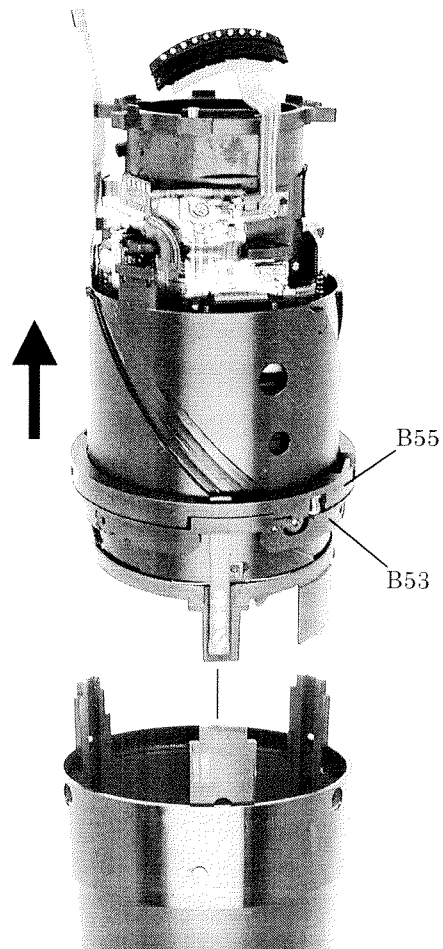




DISASSEMBLE THE FIXED TUBE UNIT



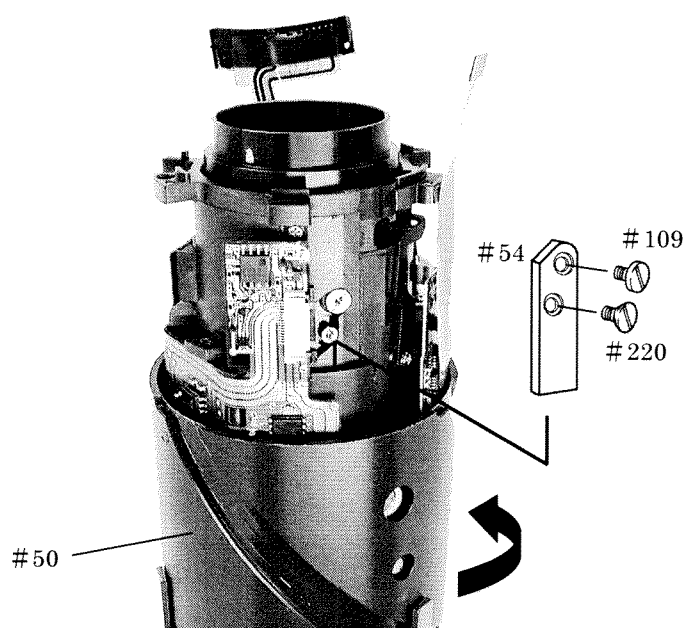
① Remove 3 pieces of #128 and 3 pieces of #96.



② Disassemble the fixed tube unit.

③ B55 and B53 can be removed in the arrow direction.

INTERLOCKING KEY #54



① Rotate the cam ring #50 in the arrow direction to touch the stopper.

② Remove the interlocking key #54.

APERTURE BLADE HOUSING UNIT

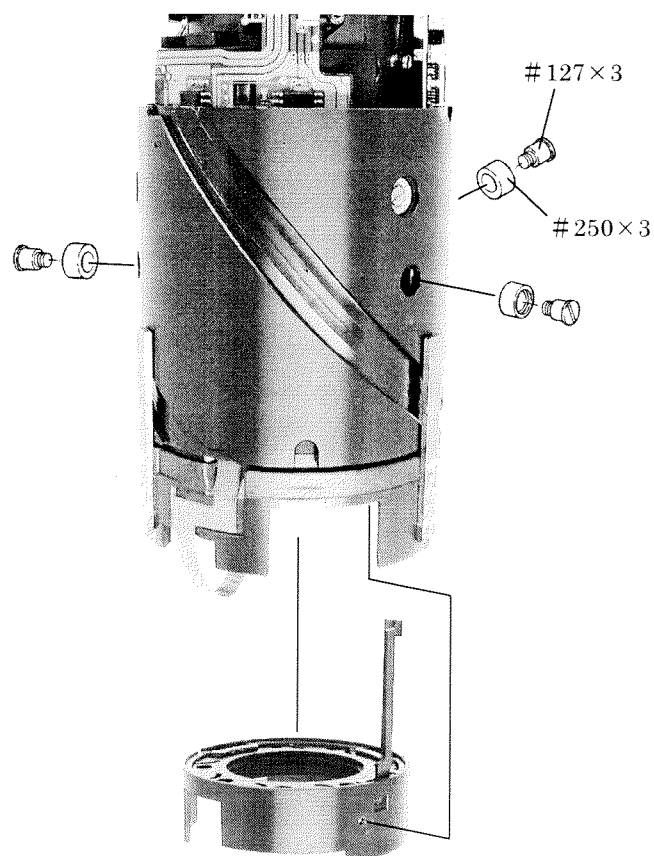
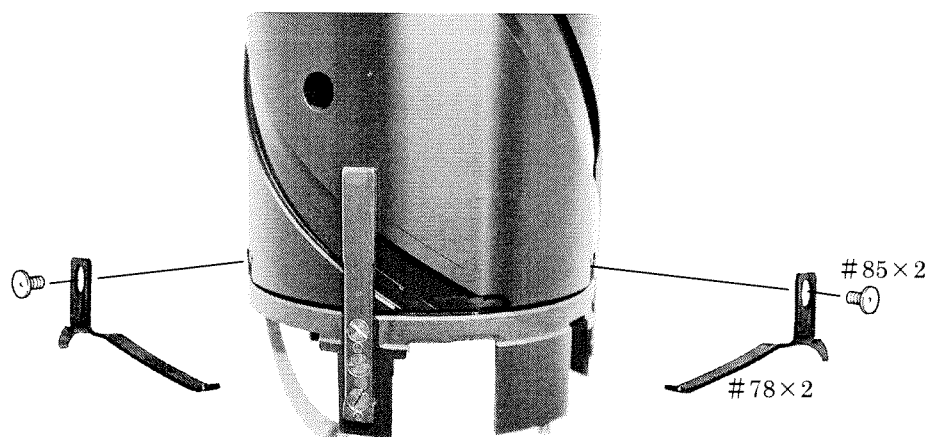
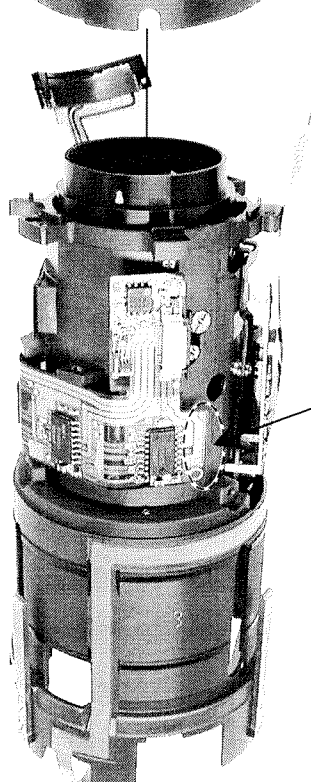
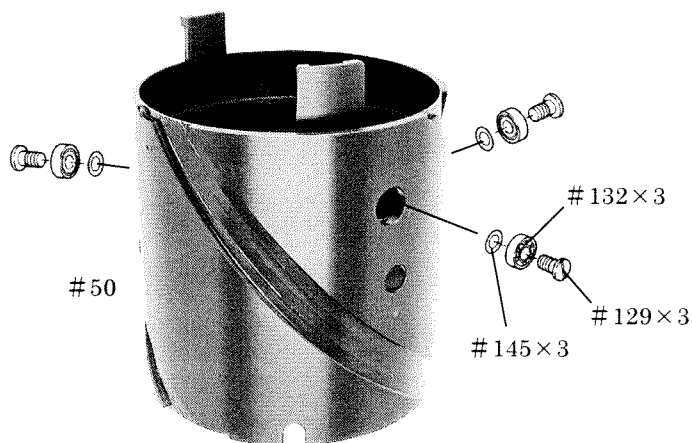


PLATE #78

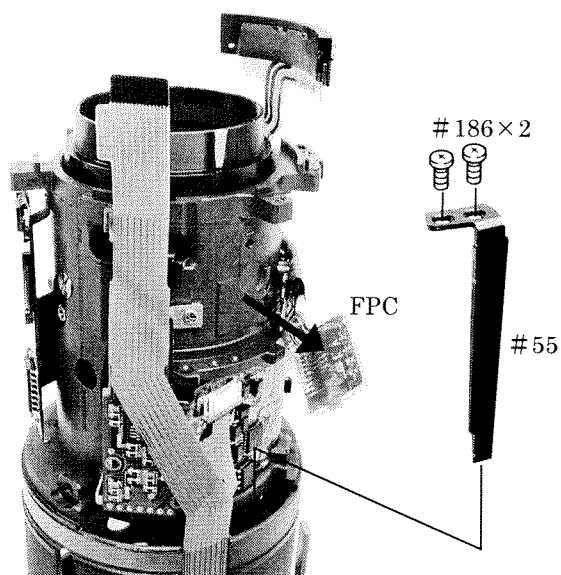


CAM RING #50



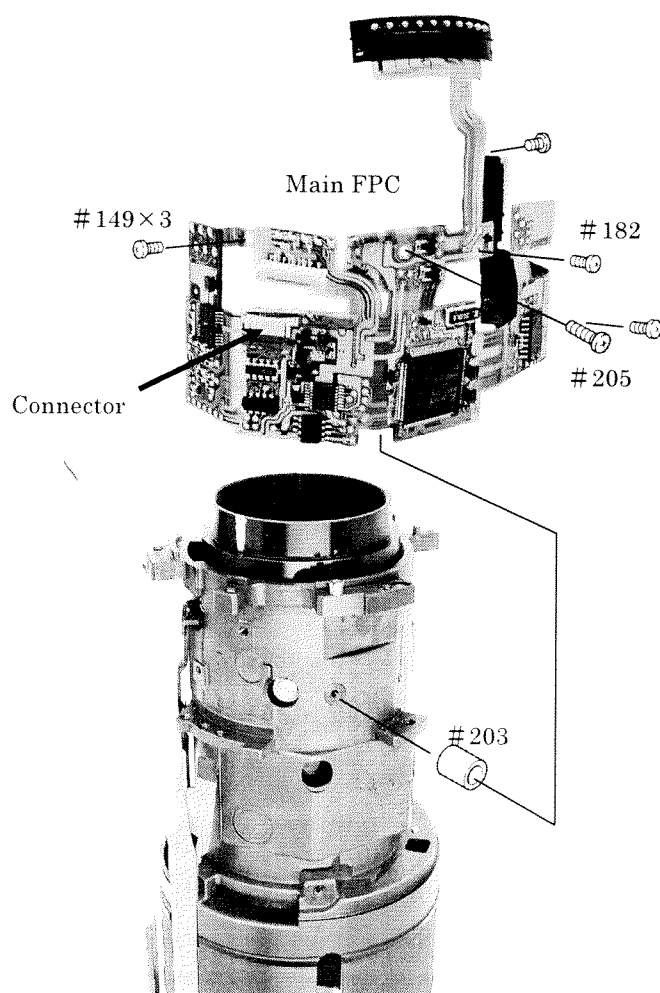
When disassembling the cam ring #50, the FPC interferes.  
Be careful when removing the cam ring #50 not to damage the FPC.

## LEVER #55



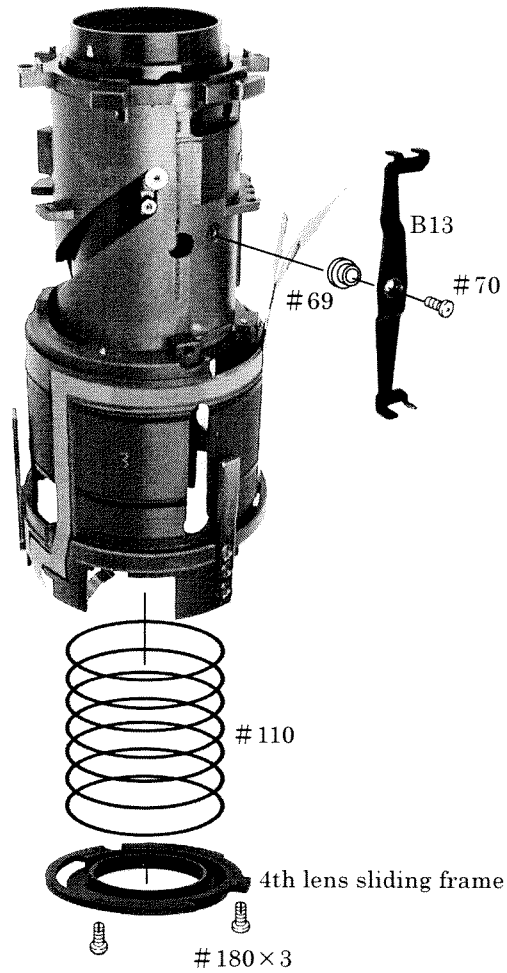
- Peel off the FPC in the arrow direction, and then remove the lever #55.

## MAIN FPC

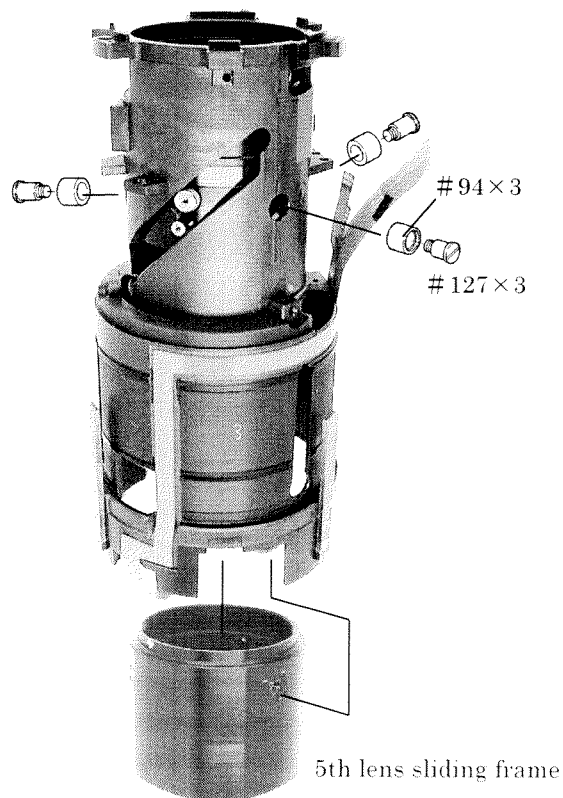


- When disassembling the main FPC, remove the relay FPC from the connector first.

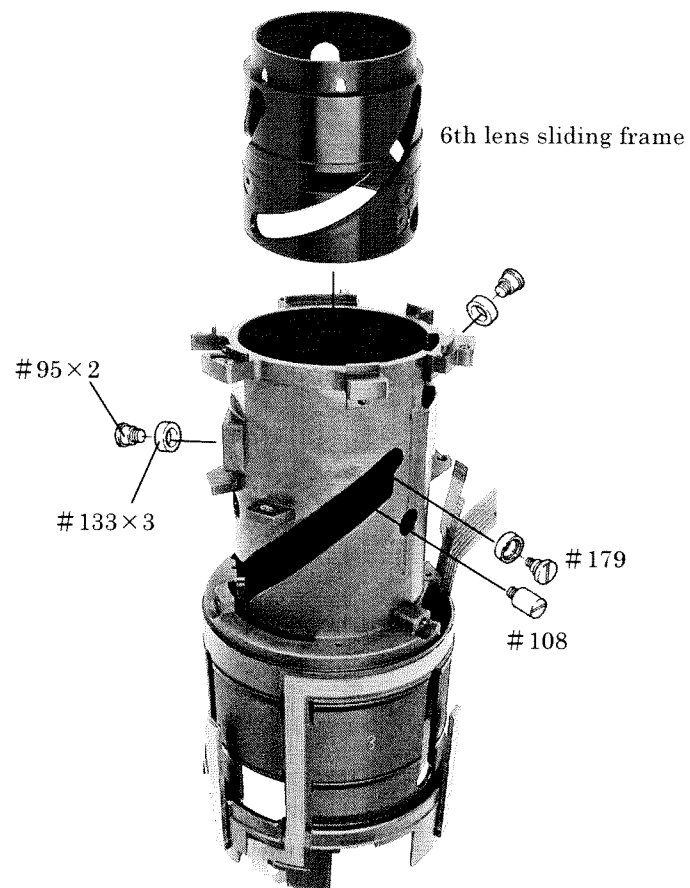
LEVER B13, 4th LENS SLIDING FRAME



5th LENS SLIDING FRAME

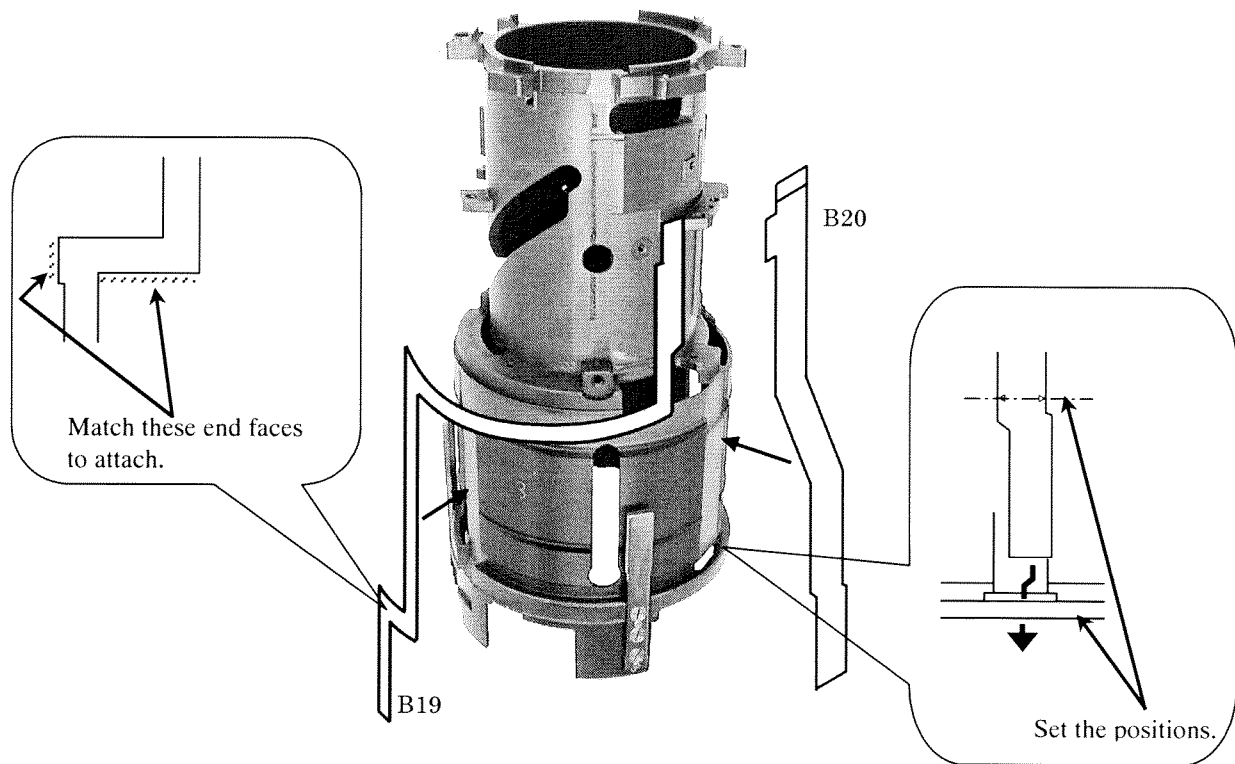


6th LENS SLIDING FRAME

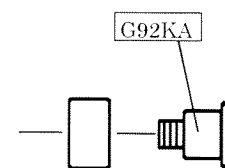
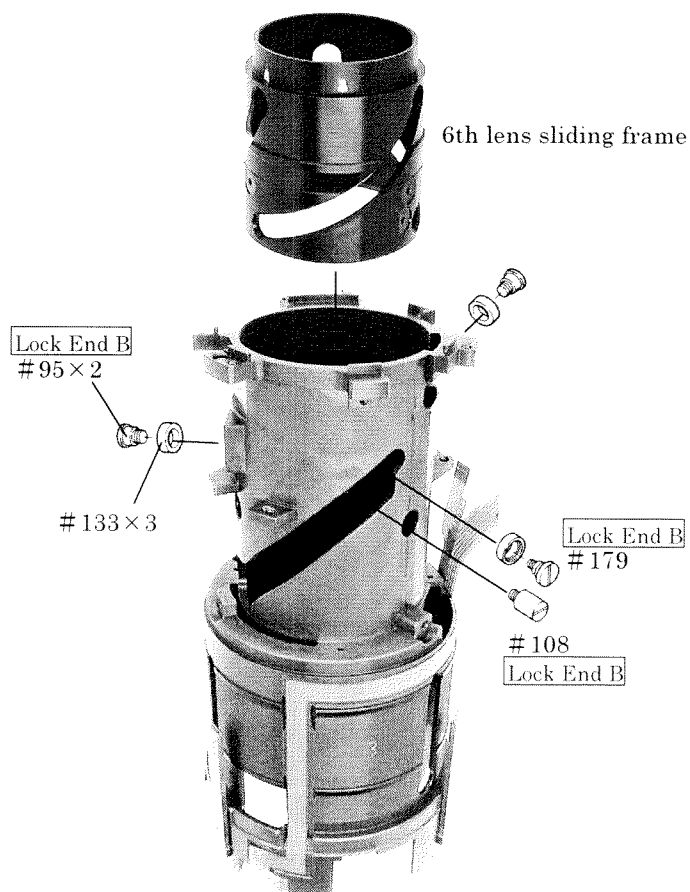


## 2. ASSEMBLING/ADJUSTMENT

### RELAY FPC

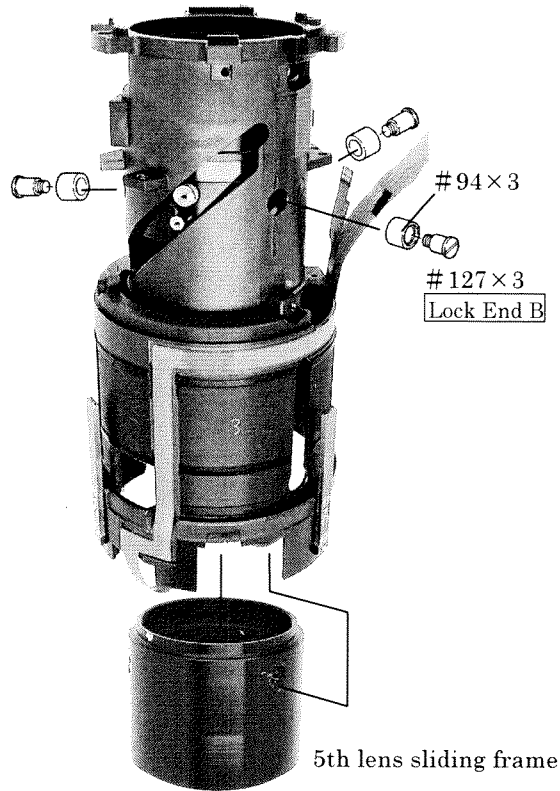


### 6th LENS SLIDING FRAME



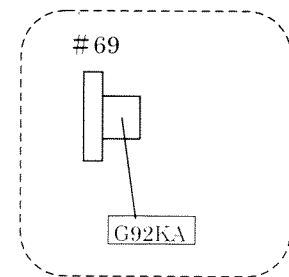
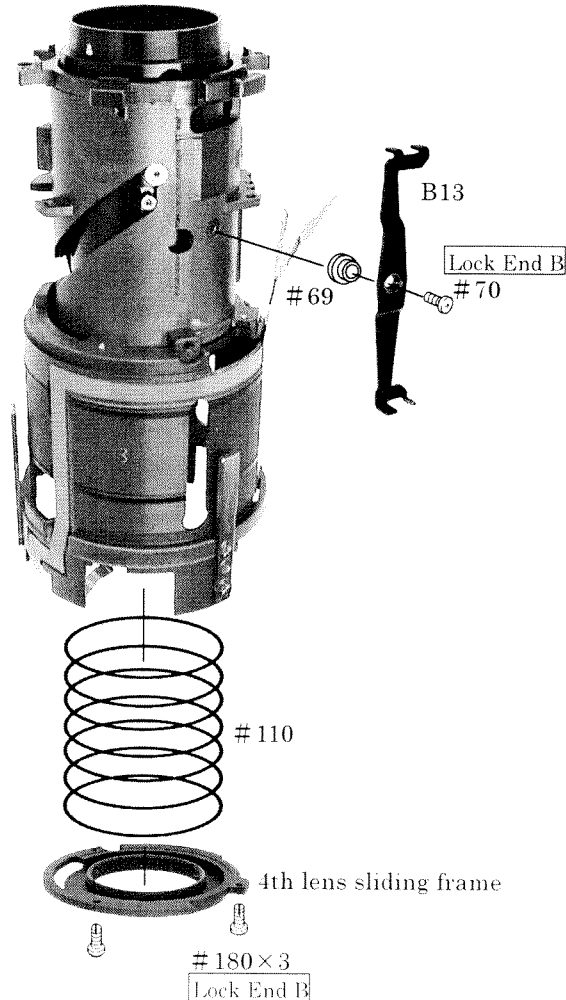
• As shown in the figure above, put the grease G92KA a little on the sliding part with the guide roller of each screw.

5th LENS SLIDING FRAME



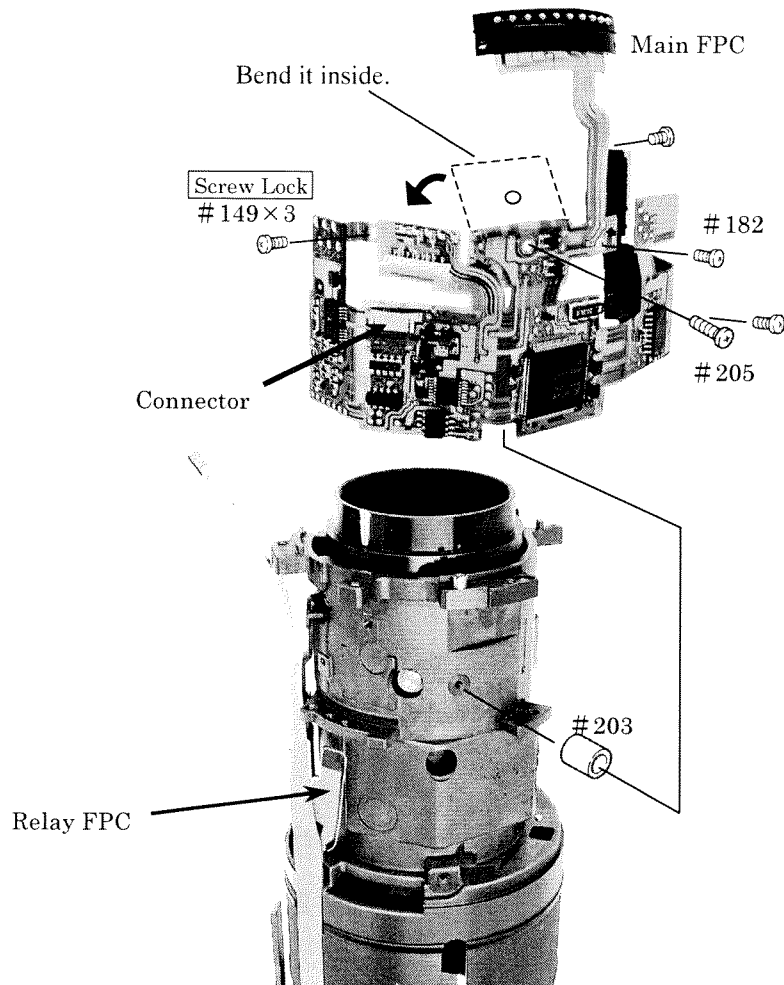
- As shown in the figure above, put the grease G92KA a little on the sliding part with the guide roller of each screw.

LEVER B13, 4th LENS SLIDING FRAME



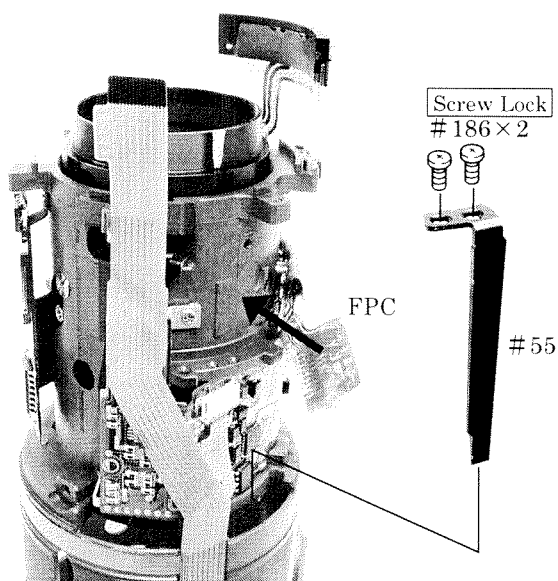


MAIN FPC



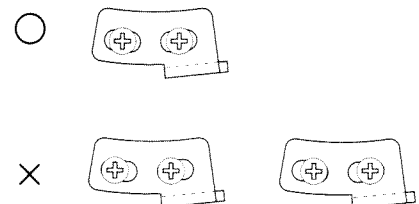
Connect the relay FPC to the connector after attaching the main FPC.

LEVER #55

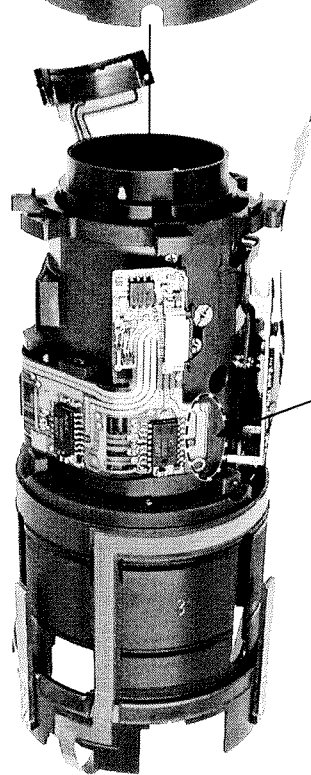
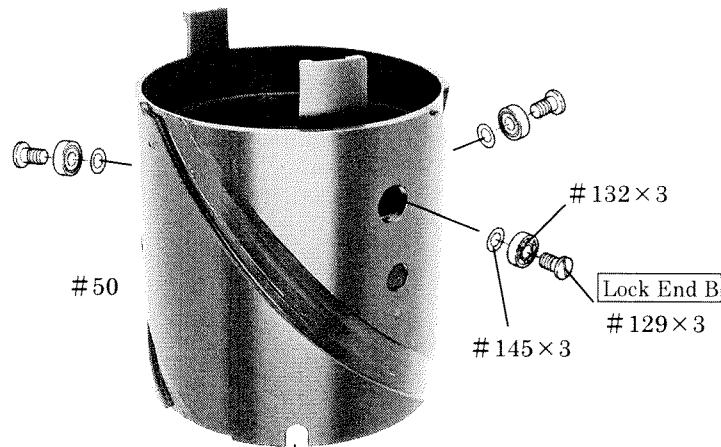


• Attach the FPC after mounting the lever #55.

Mounting position of #55.

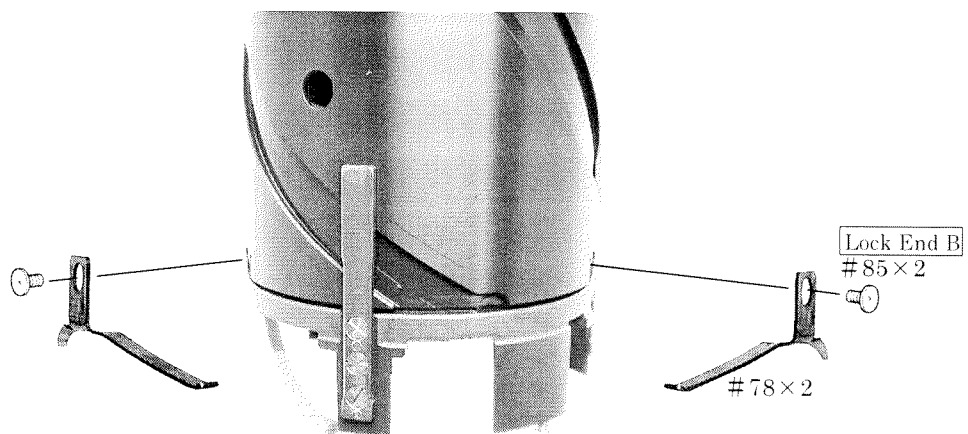


CAM RING #50

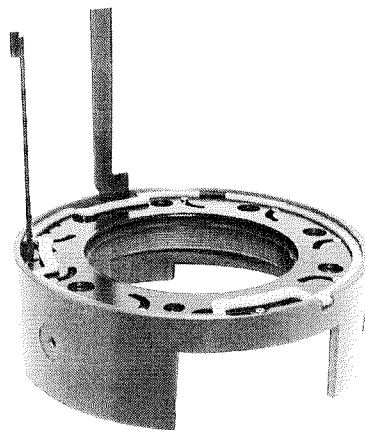
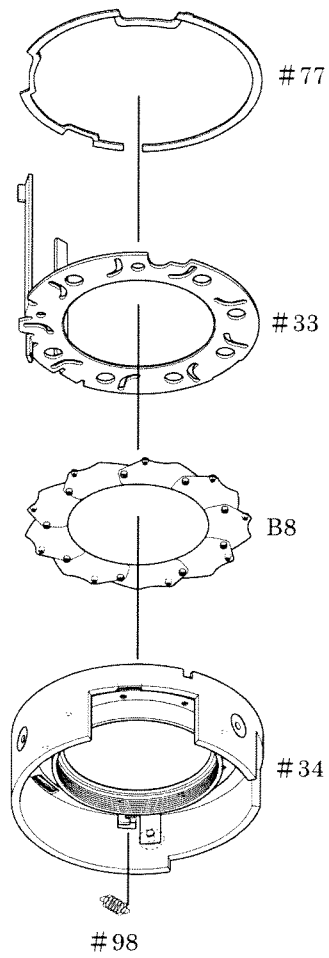


When assembling the cam ring #50, the FPC interferes.  
Be careful when assembling the cam ring #50 not to damage the FPC.

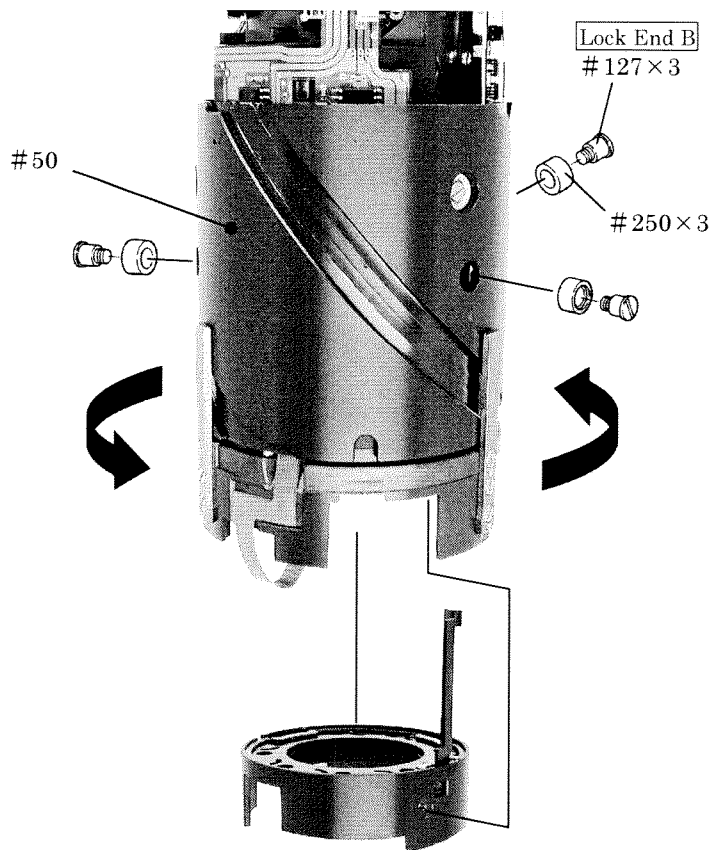
PLATE #78



APERTURE BLADE GROUP

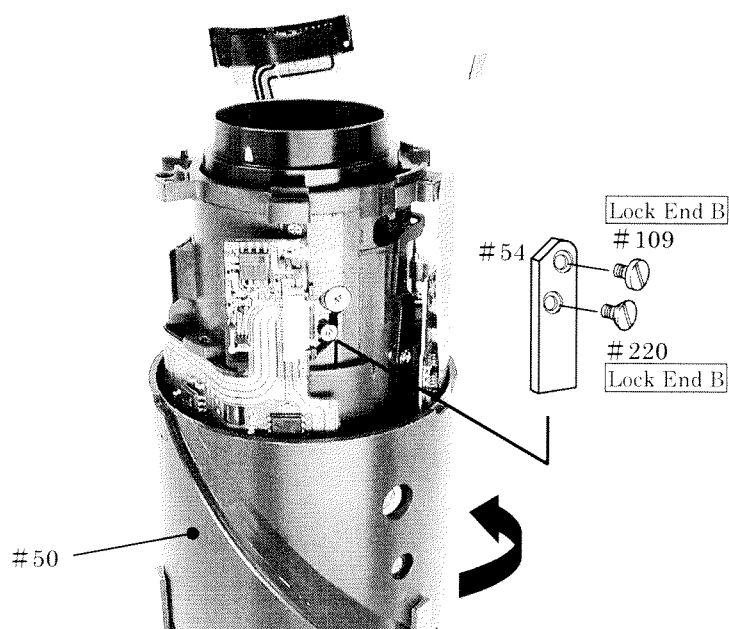


# APERTURE BLADE HOUSING UNIT



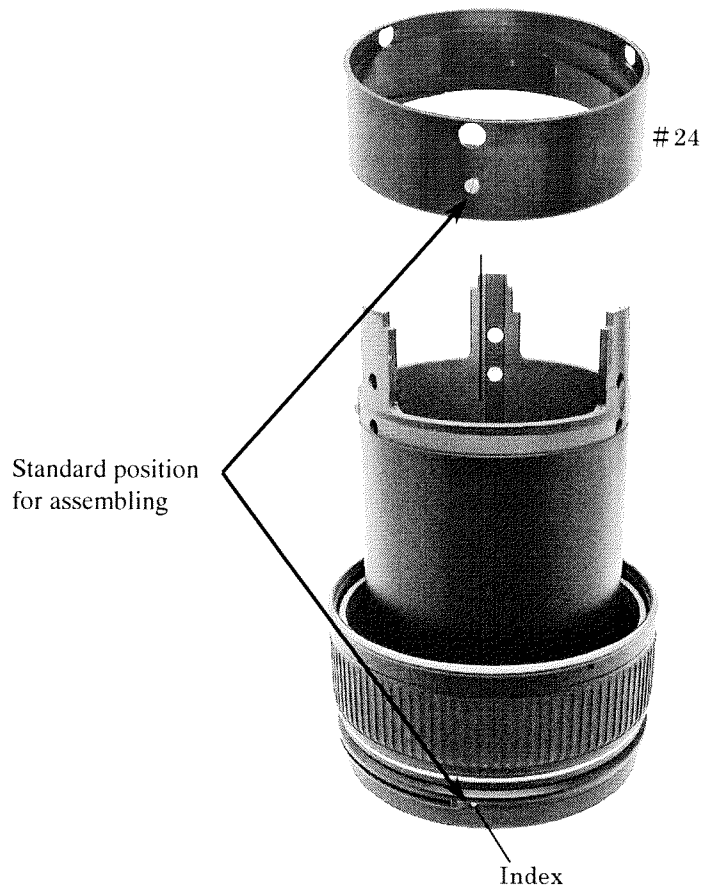
- ① Rotate the cam ring #50 in the arrow direction and mount the aperture blade housing unit just before touching its stopper.

## INTERLOCKING KEY #54



- ① Rotate the cam ring #50 in the arrow direction to touch its stopper.
- ② Mount the interlocking key #54.

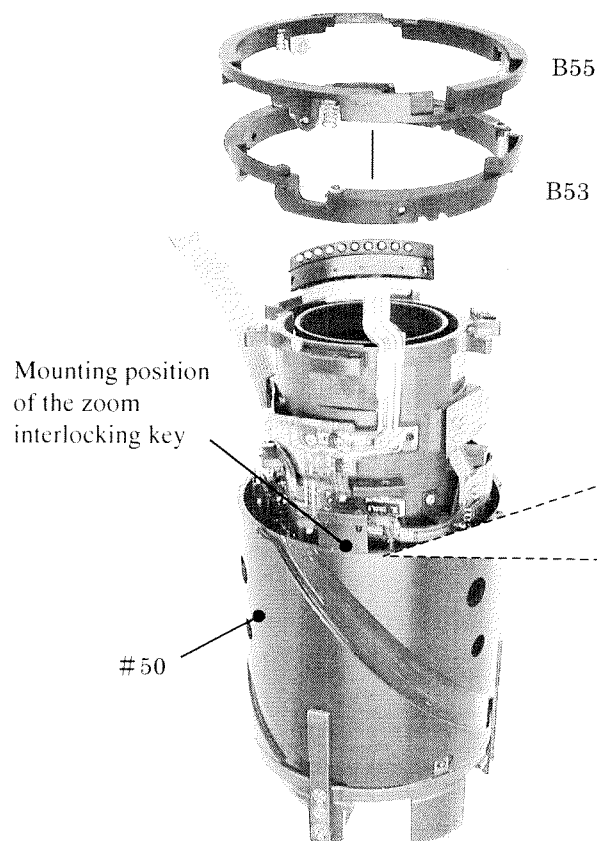
FOCUS INTERLOCKING RING #24, 1st SLIDING RING



① Spread G92KA on the cam groove inside #24.

② Set the standard position and assemble it.

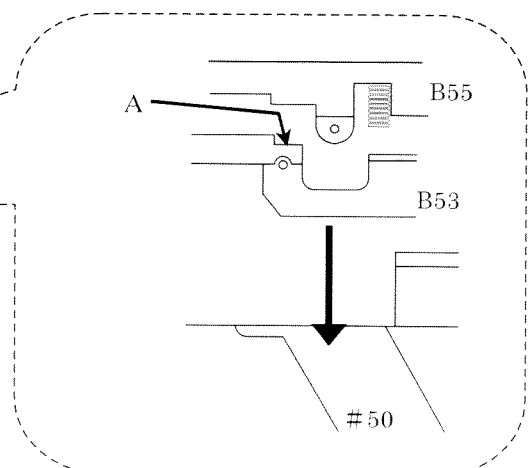
RING B53、B55



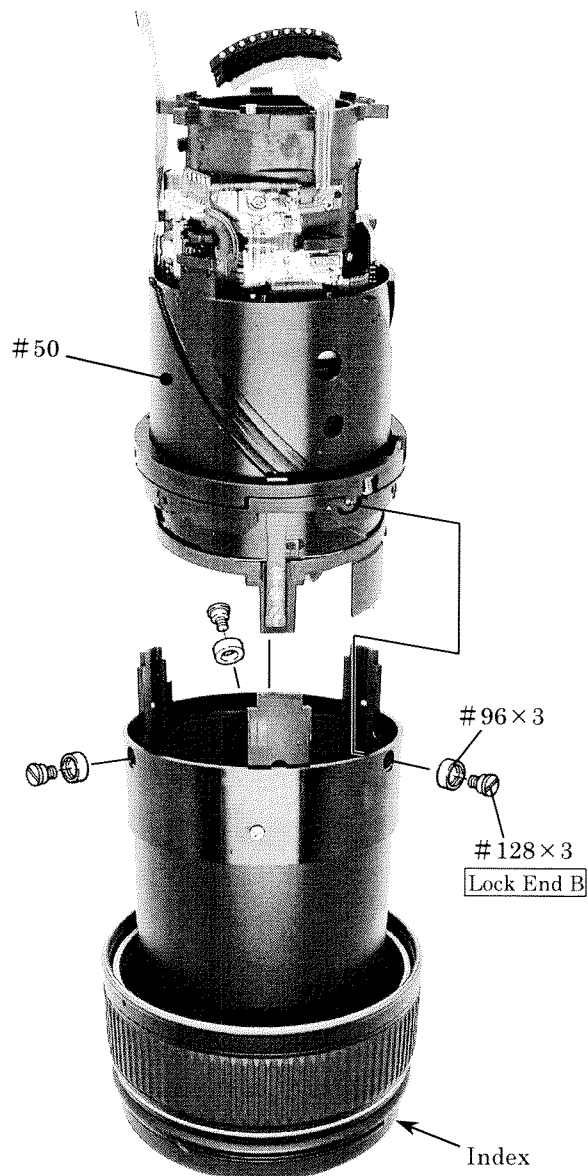
• As shown in the figure below, set A to B and then assemble them.

A: The narrowest surface of the step of B53

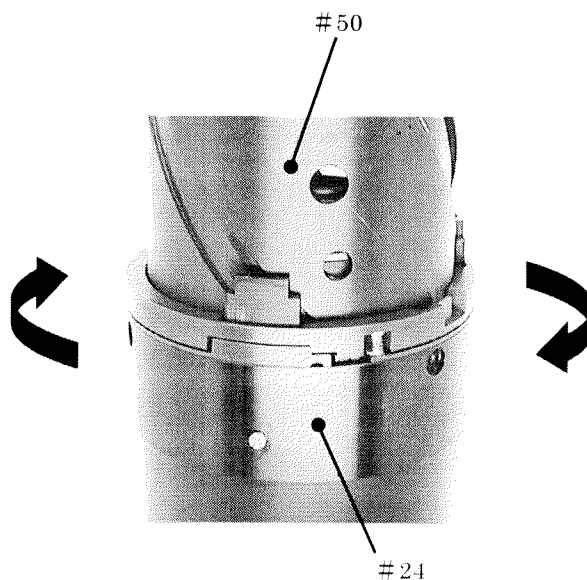
B: The groove that is the nearest the attaching position of the zoom interlocking key #50.



## ASSEMBLING THE FIXED TUBE UNIT



- Rotate #50 and assemble it while meeting the position.



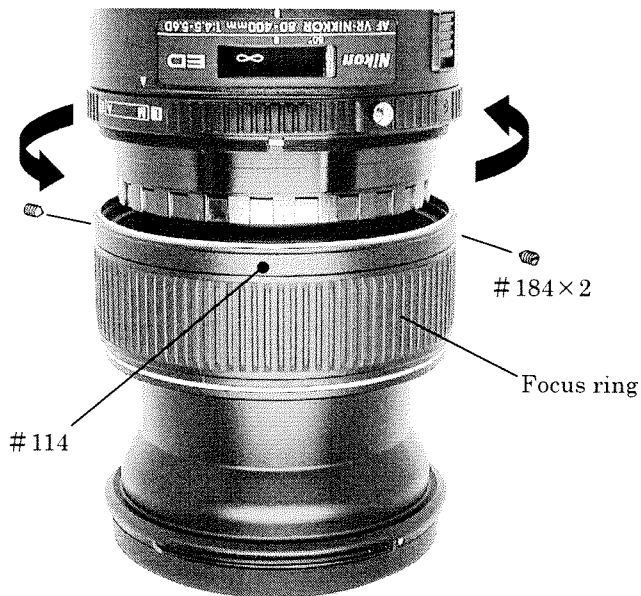
- After assembling the fixed tube unit, rotate #24 and #50 in the arrow direction until they touche their stopper to avoid B53 and B55's coming off.

EXTERNAL UNIT



- When assembling, rotate #24 and set 2 places of the convex to 2 places of the straight groove.

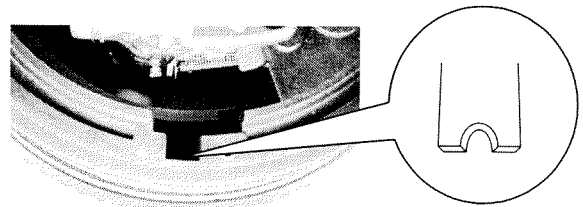
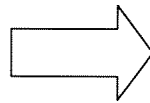
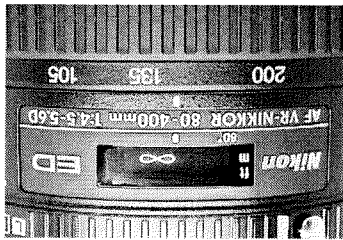
## FOCUS RING



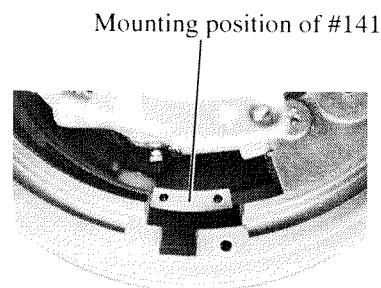
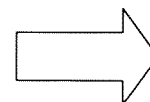
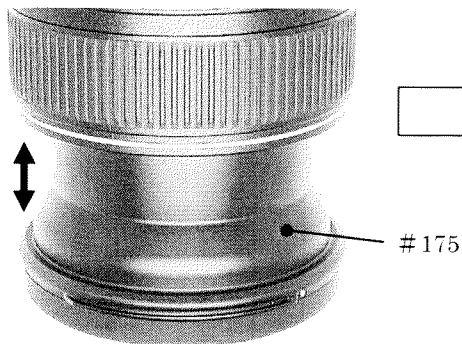
- ① Rotate #114 in the arrow direction and assemble the focus ring.
- ② Screw 2 pieces of the screws #184 after drilling a little.
- ③ Put the flat black paint on the screw head.

## ZOOM INTERLOCKING KEY

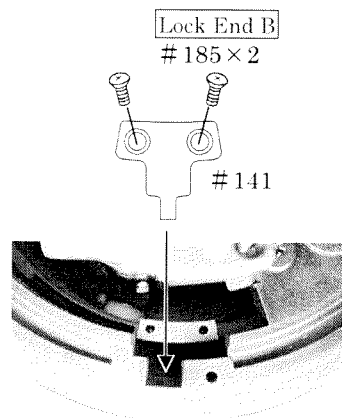
- ① Rotate the zoom ring and set it to the position shown in the figure below.



- ② Move #175 by hand-operated, and set it to the position where you can see the mounting position of #141.

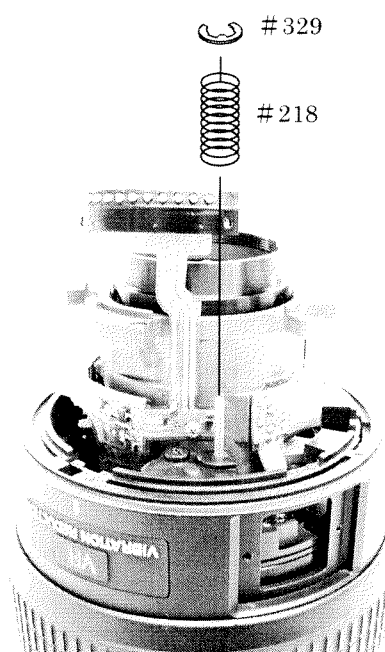
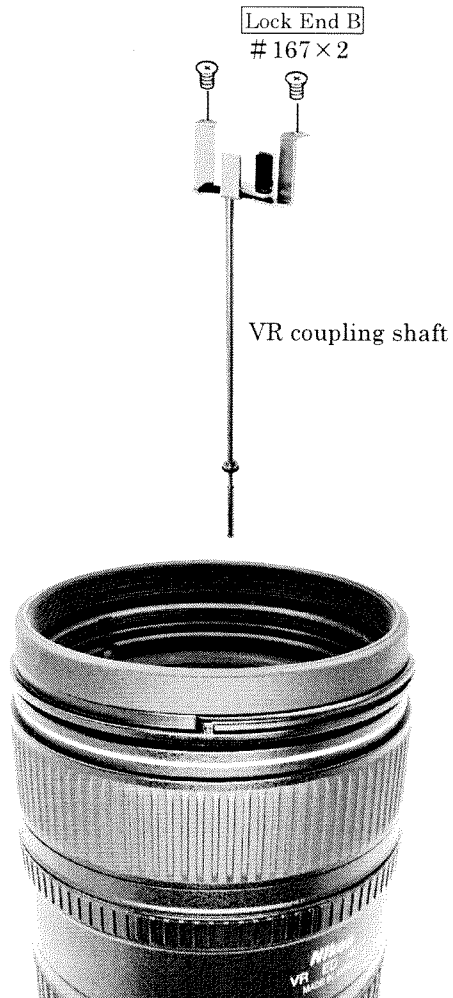


- ③ Mount the zoom interlocking key #141.

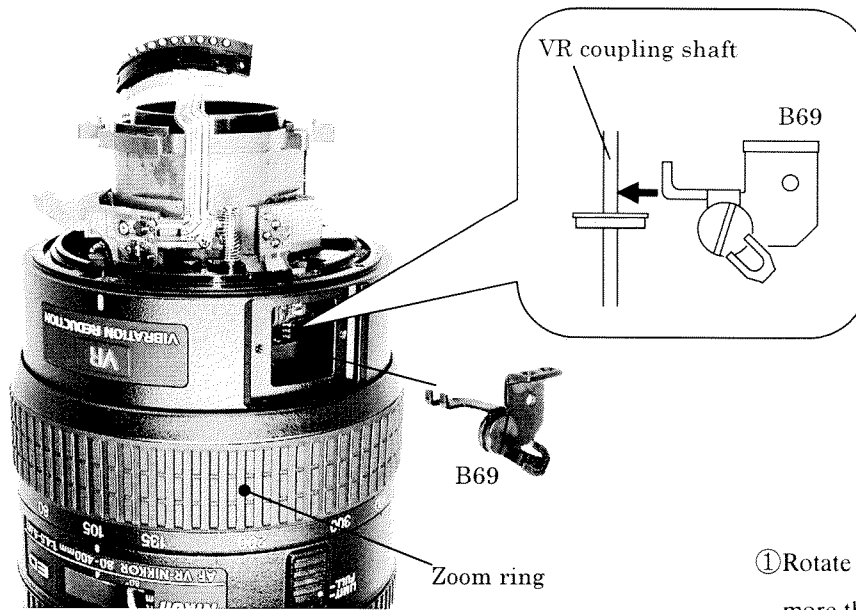




VR COUPLING SHAFT



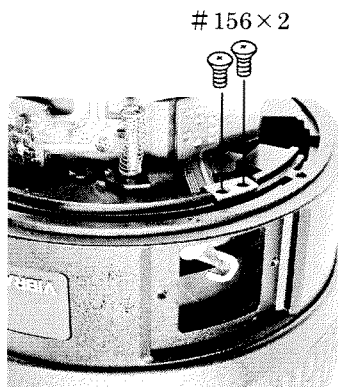
# SWITCHING LEVER



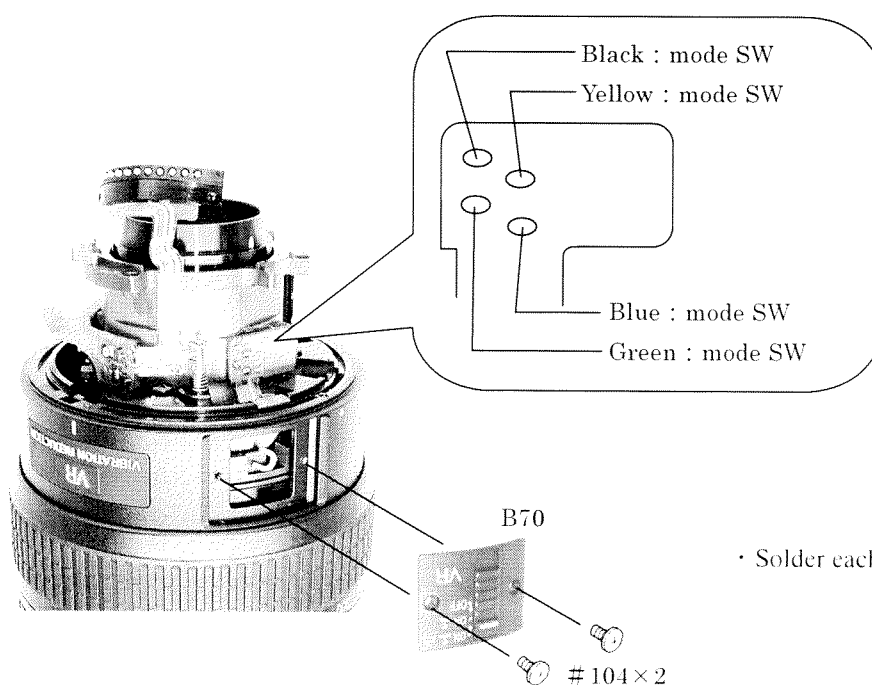
① Rotate the zoom ring and set it to more than 105mm on TELE side.

② Assemble the switching lever B69.

③ Screw 2 pieces of screws #156.

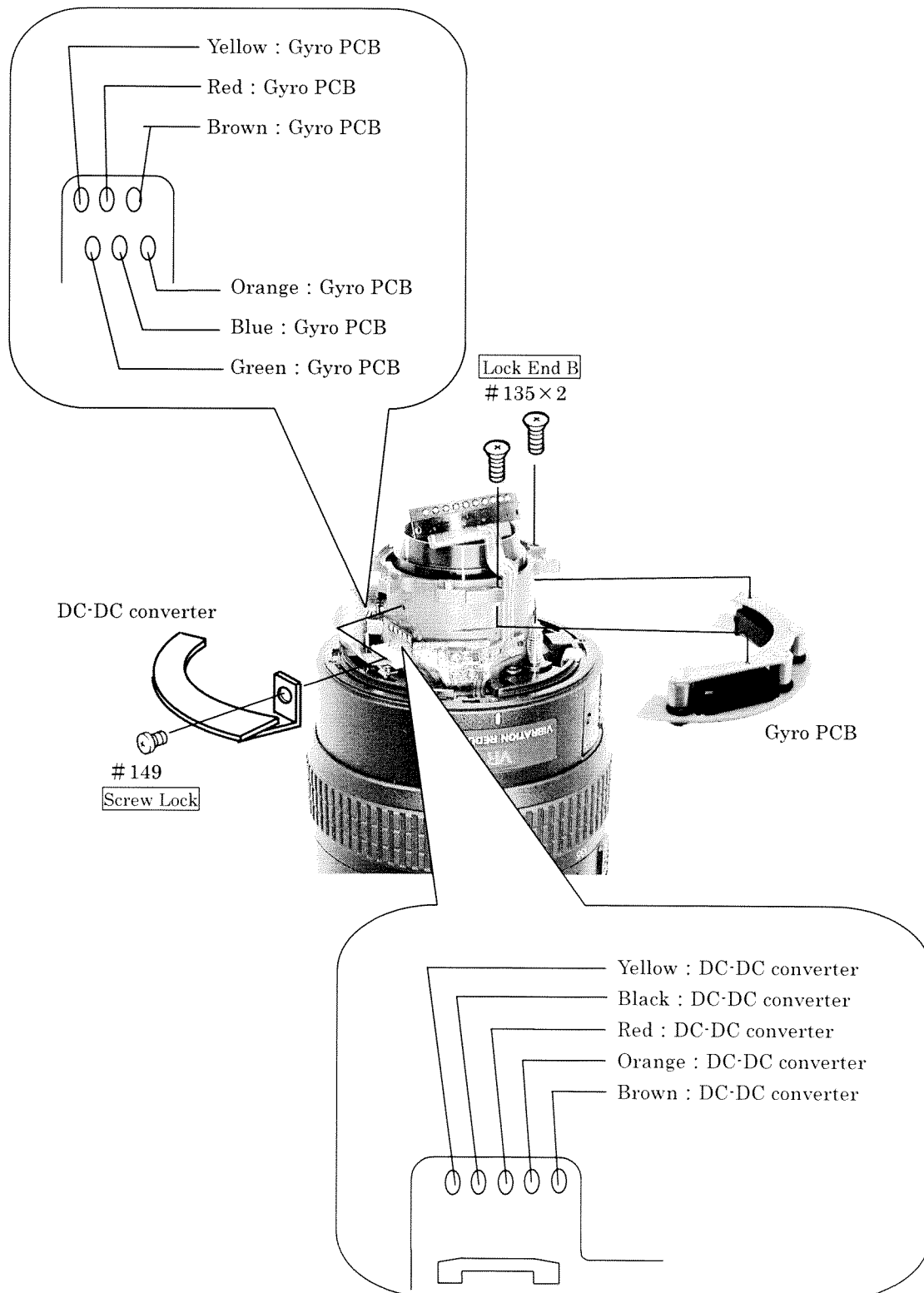


# VIBRATION REDUCTION MODE SWITCH



• Solder each wire.

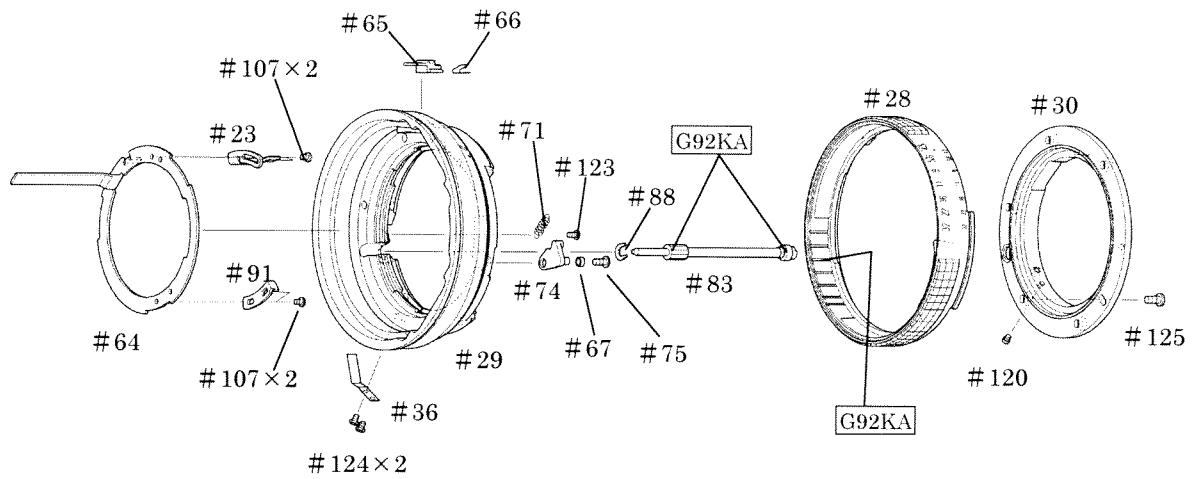
## GYRO PCB, DC-DC CONVERTER



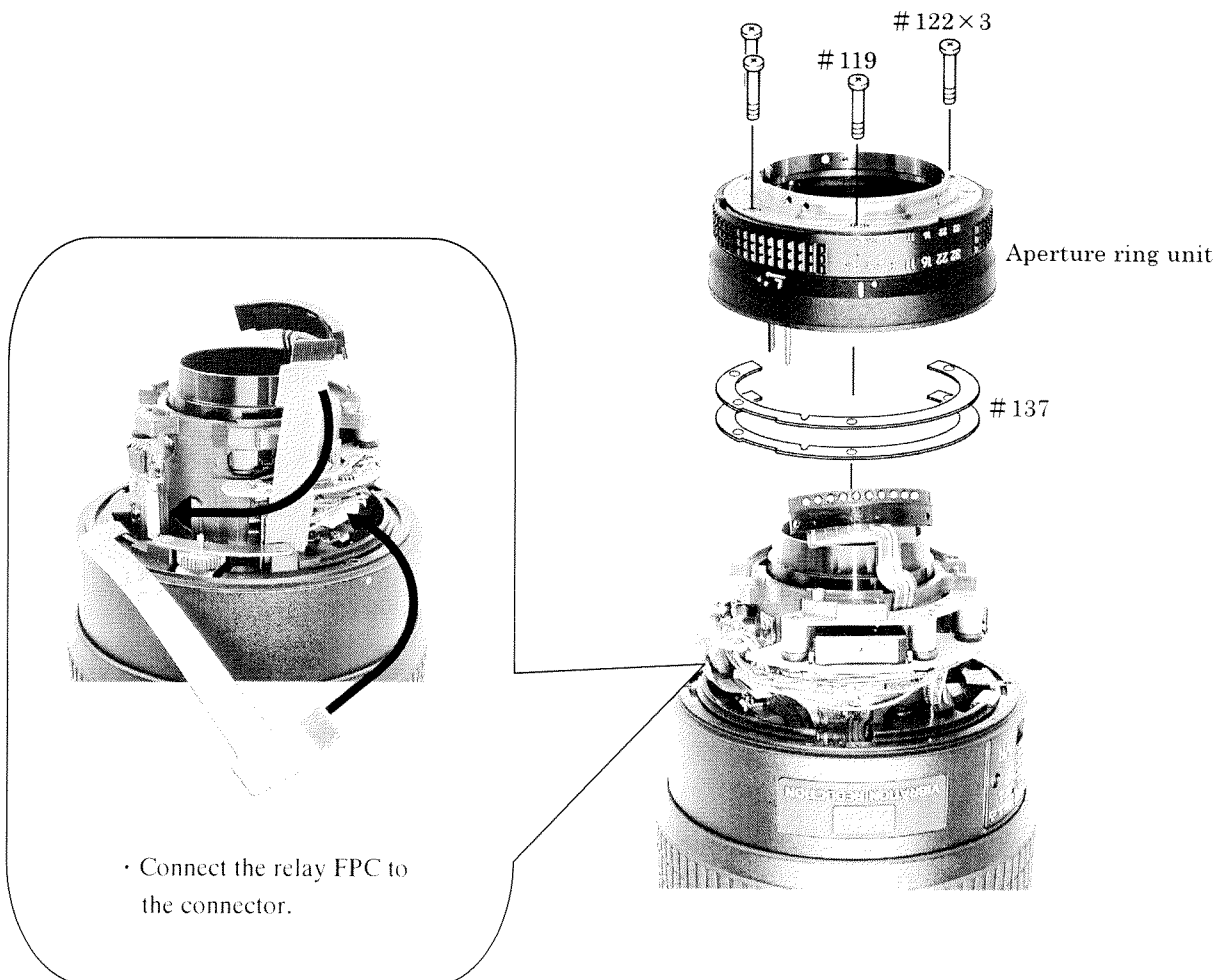
- Mount the gyro PCB and the DC-DC converter, and solder each wire.

**Notes :** The gyro PCB unit has possibility that it cannot maintain its accuracy even with a little impact, therefore, handle it with care.

APERTURE RING, BAYONET MOUNT GROUP



APERTURE RING UNIT



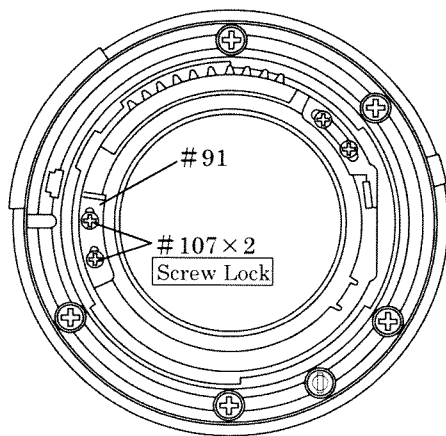
# APERTURE DIAMETER ADJUSTMENT

- ①Unfasten screws #107×2 and move part #91 to adjust the aperture diameter.

**Note :** Make sure that the aperture diameter differs when the zoom ring is set to 80mm and to 400mm.

- Aperture lever should be within the allowable range when the aperture lever is snapped by your finger.

- ②After adjustment, secure screws #107×2 using Screw Lock.



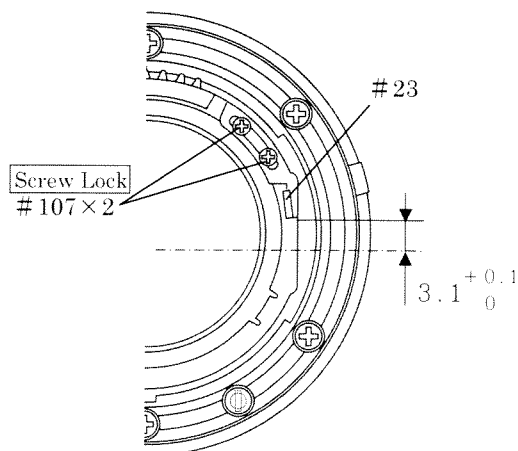
When the zoom ring is set to 80 mm :

Aperture setting	Inscribed circle diameter (mm)	Allowable range (mm)
4.5	24.22	25.75 ~ 22.69
5.6	19.63	22.04 ~ 17.49
8	13.80	15.49 ~ 12.29
11	9.72	11.34 ~ 8.34
16	6.86	8.00 ~ 5.88
22	4.84	5.65 ~ 4.15
32	3.42	3.99 ~ 2.94

When the zoom ring is set to 400 mm :

Aperture setting	Inscribed circle diameter (mm)	Allowable range (mm)
4.5	30.29	32.44 ~ 28.14
5.6	23.94	26.87 ~ 21.32
8	16.78	19.58 ~ 14.39
11	11.82	13.79 ~ 10.13
16	8.34	9.73 ~ 7.15
22	5.89	6.87 ~ 5.05
32	4.16	4.86 ~ 3.57

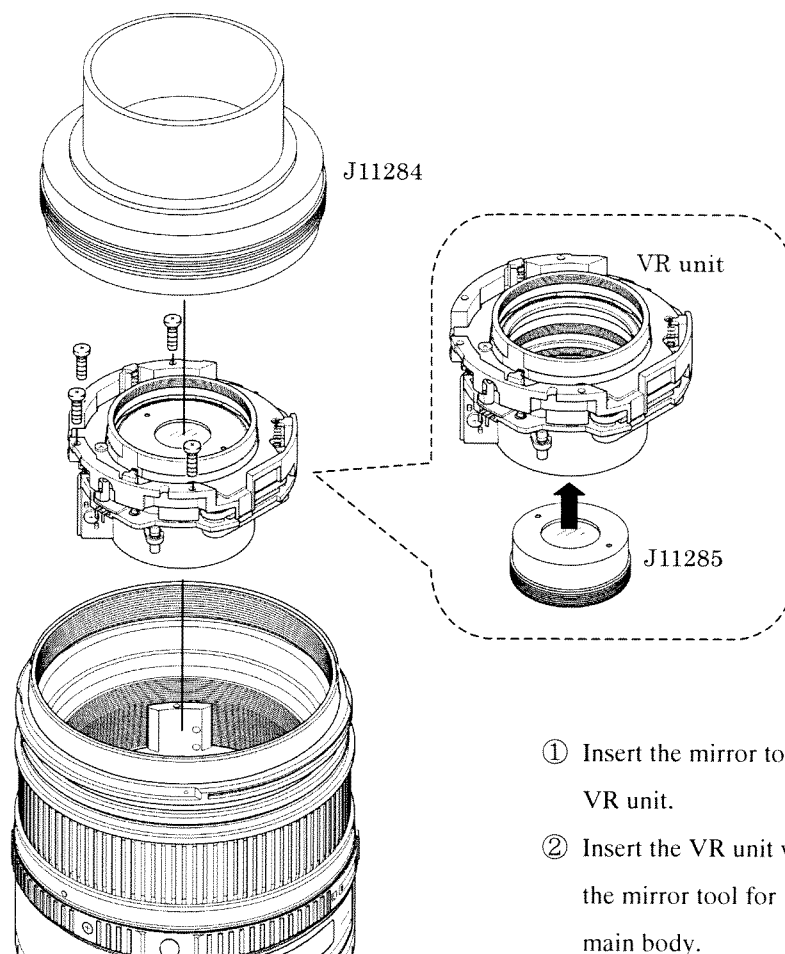
# APERTURE LEVER POSITION ADJUSTMENT



Unfasten screws #107×2 to adjust the position of the aperture lever #23 so that it comes into the rated value of  $3.1^{+0.1}_0$  to bring the aperture diameter within rated value at full aperture.

After adjustment, fix screws #107×2 using Screw Lock.

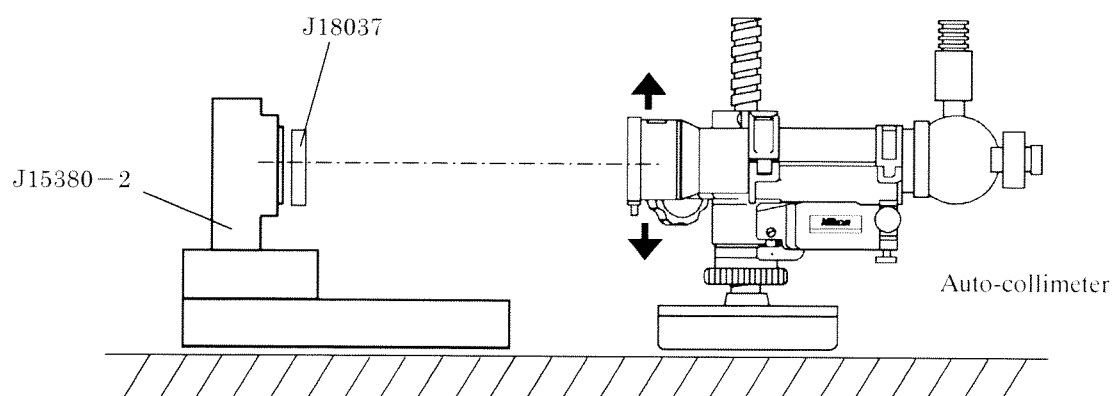
## 1st LENS GROUP INCLINATION ADJUSTMENT



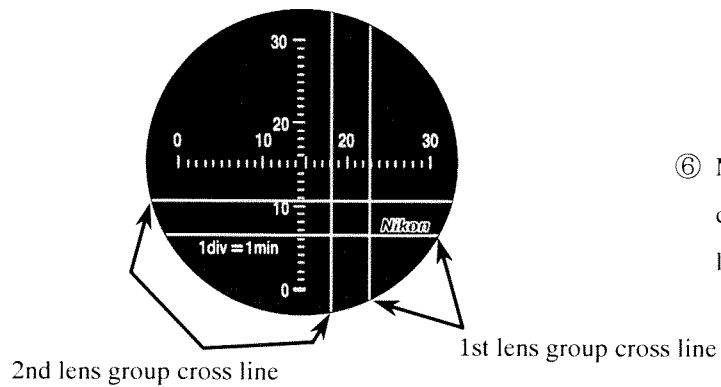
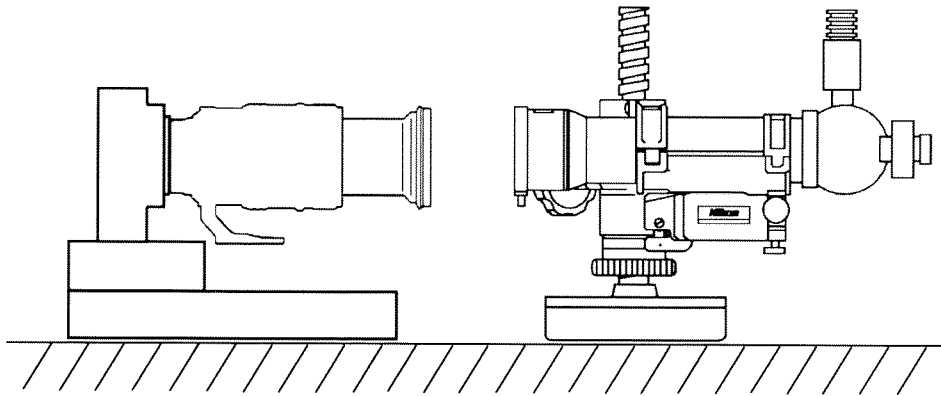
- ③ Set the optical parallel (J18037) to the stand (J15380-2).
- ④ Adjust the auto-collimeter's position to match the optical axis against the stand.

〈Reference〉

Adjustment for optical axis can be performed without J18037, if there is a parallel glass or a parallel mirror, etc.



- ⑤ Put the lens on the stand (J15380-2), and then measure it at the TELE side.

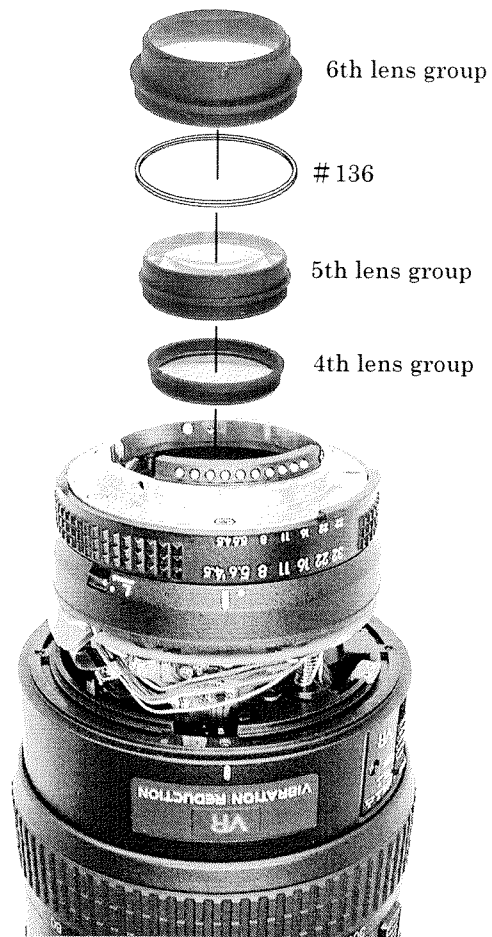


- ⑥ Measure the difference of the 1st lens group cross line against the 2nd lens group cross line as shown in Figure on the left.



- ⑦ If the difference of the cross line is over 1min, attach the polyester film tape (TA-0012) on the touching face between the 1st lens group barrel and the lens main body as shown on the left to adjust the inclination.
- ⑧ Remove the mirror tools after adjustment.

## 4~6th LENS GROUP

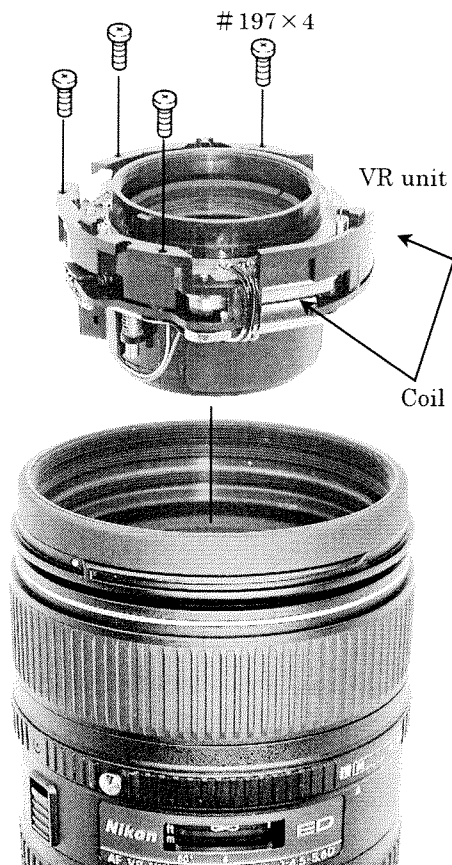


## 3rd LENS GROUP





## VR UNIT

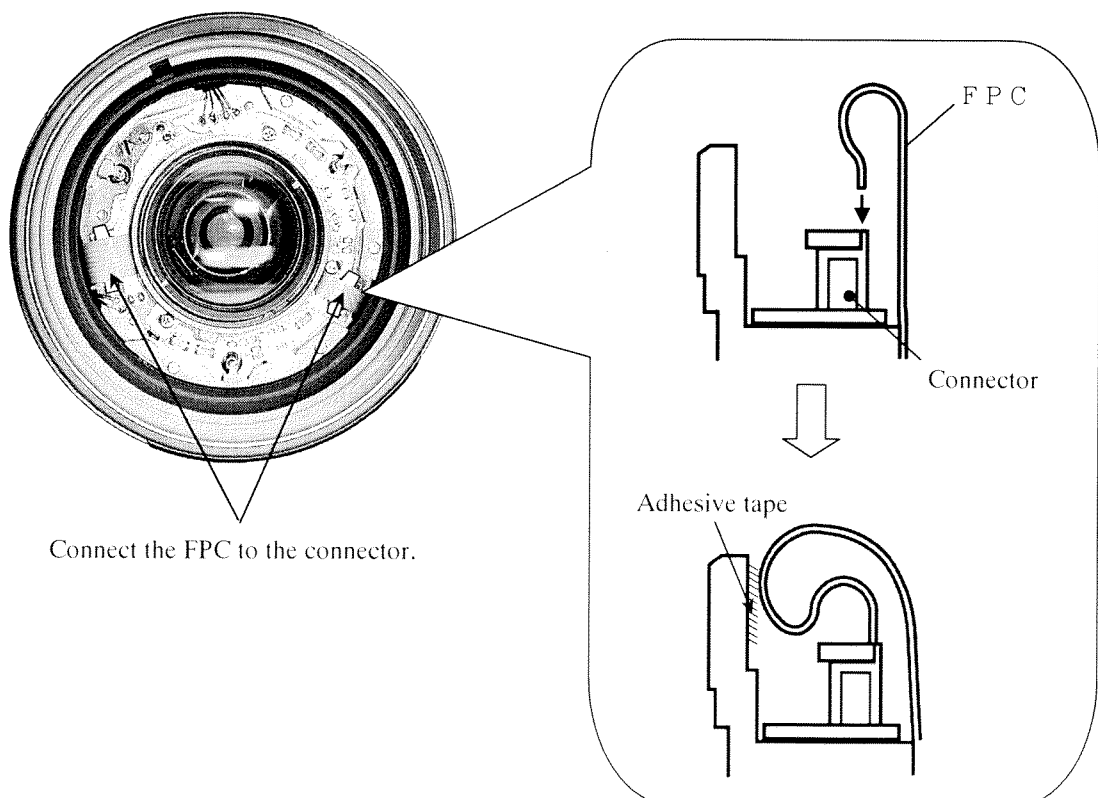


## Notes :

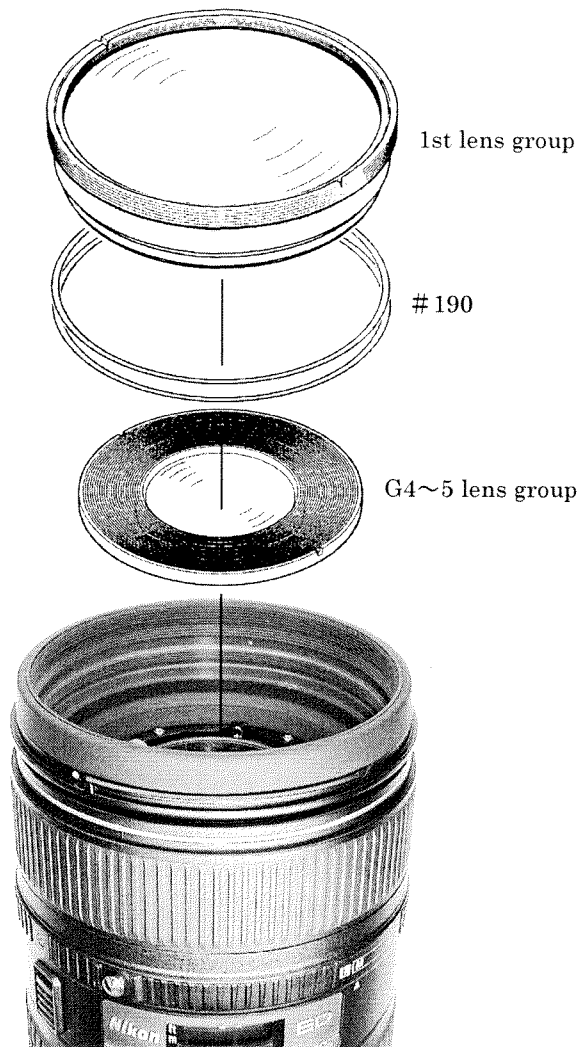
① Be careful that the VR unit cannot maintain its accuracy if receiving an impact and so on.  
The coil on the exterior of it is the magnet for the performance control. Do not mix a foreign substance that might be cause of the performance trouble in it.

② Use the exclusive tool when disassembling the lens in the VR unit.  
(Refer to Page L2-1)

③ After connecting the FPC to 2 places of the connector, fix the FPC and the VR unit with the both-sided adhesive tape as shown in the figure below.



## FRONT LENS GROUP



## ADJUSTMENT AT BOTH ENDS OF FOCAL LENGTH

1. Align the  $\infty$  mark on focus ring to index. Set aperture to full aperture.
2. Read the value on both Wide and Tele sides respectively.
3. Calculate the following equation.

$$(A - B) \div 10 = C$$

A=Value of Tele side (mm)

B=Value of Wide side (mm)

C=Amount (mm) of adjustment of 1st lens group  
washer #190

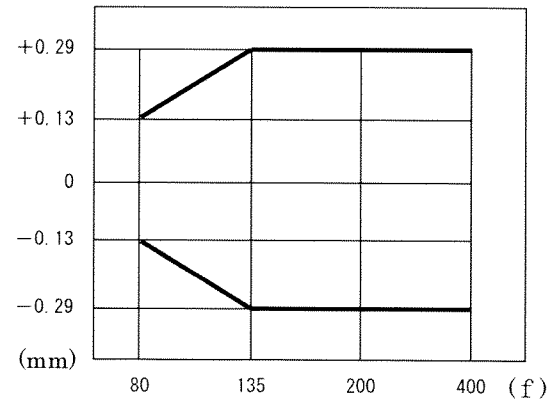
4. Adjust the thickness of washer #190 by the value C calculated from the above equation.  
If the value C is positive, thicken the washer by the value, and if negative, thin the washer.
- Note :** Insert thin washer between thick washers when mounting washer #190.

## ADJUSTMENT OF BACK FOCUS

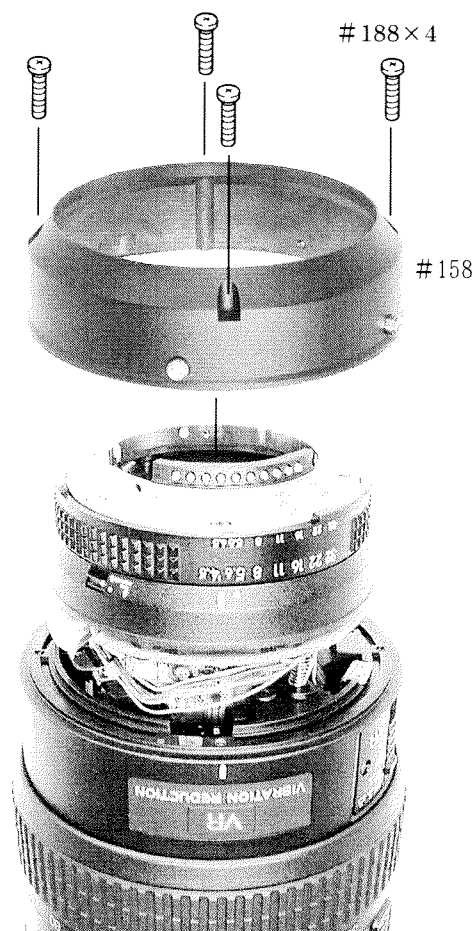
1. Align the  $\infty$  mark on focus ring to index. Set aperture to full aperture.
2. Readout values at either Wide or Tele side.
3. Remove the aperture ring unit.
4. If the value is above the standard, increase the thickness of the washer, otherwise decrease it.

(Refer to page L29.)

Focal length (f)	Standard (mm)
80 mm	-0.13 ~ +0.13
135 mm	-0.29 ~ +0.29
200 mm	-0.29 ~ +0.29
400 mm	-0.29 ~ +0.29



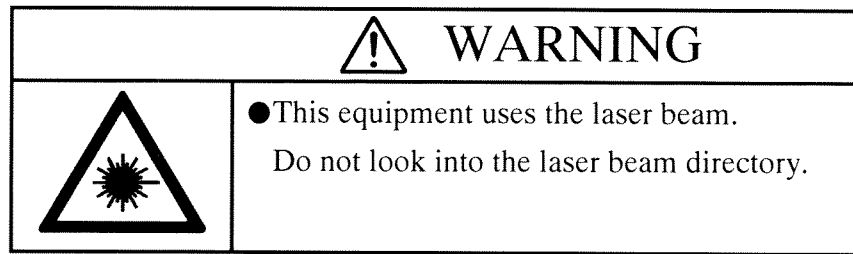
## RING #158





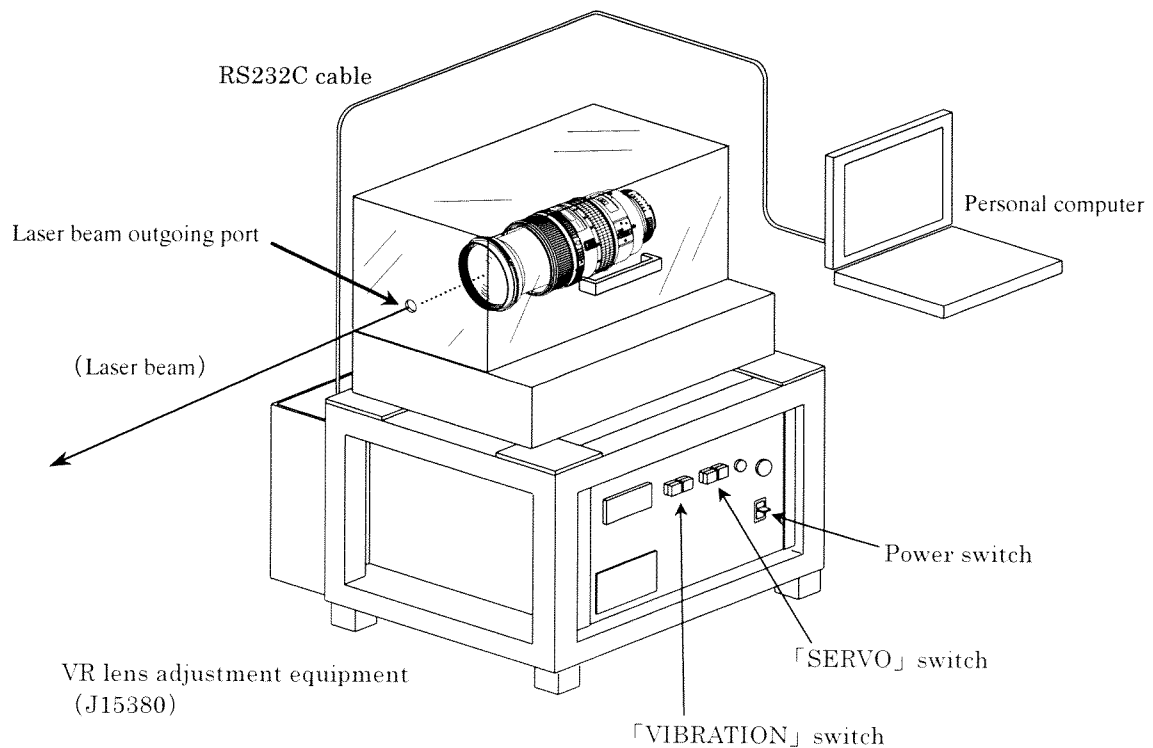
## VR ADJUSTMENT

When performing the VR adjustment, please refer to the [Instruction Manual] attached to the VR lens adjustment equipment (J15380).



### Preparation for the VR adjustment

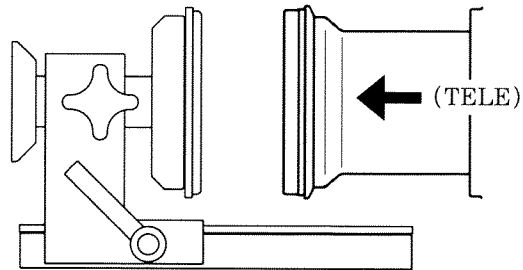
- ① Set up the VR lens adjustment equipment (J15380) as shown in Figure below.
- ② Connect the personal computer to the equipment and run the personal computer.
- ③ Mount the lens on the equipment. Set the focus ring to the infinity position and the zoom ring to TELE side.  
Please refer to the next page for the procedure to mount the lens.



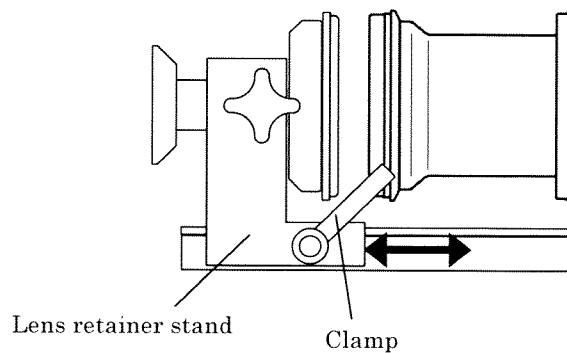
**Notes:** The distance from the laser beam outgoing port to the radiation face should be about 5m apart.  
Do not intercept the optical path of the laser beam.

# Procedure to mount the lens

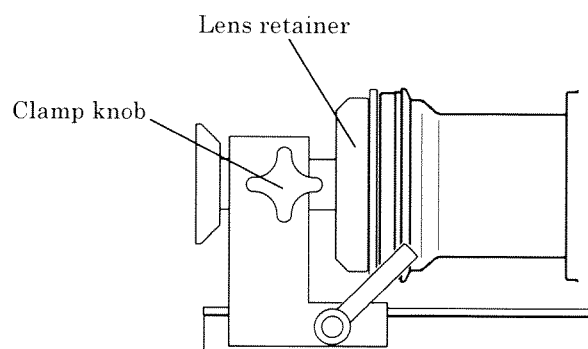
- 1 . Mount the lens on the equipment and set it to TELE side.



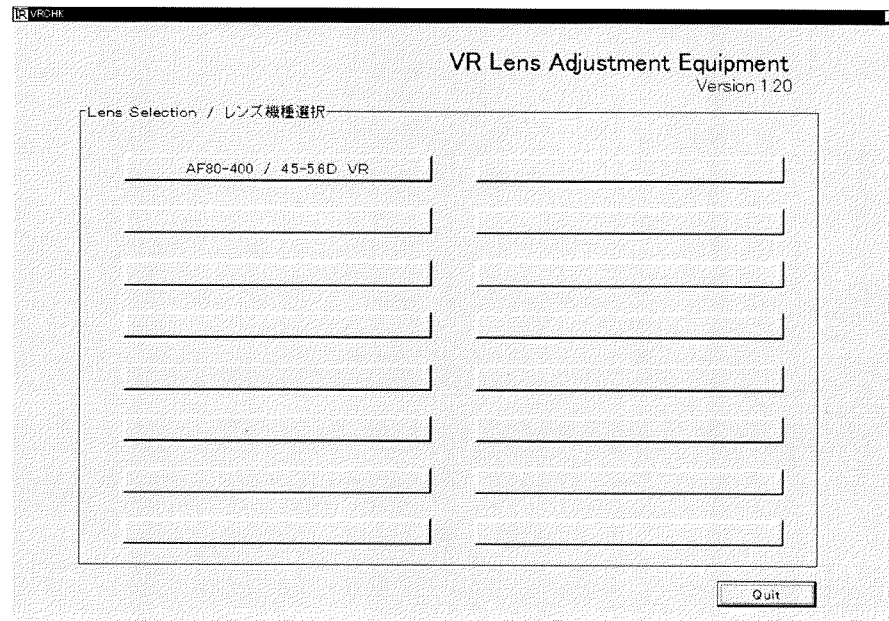
- 2 . Move the lens retainer stand to the position shown in Figure below and fix it by tightening the clamp.



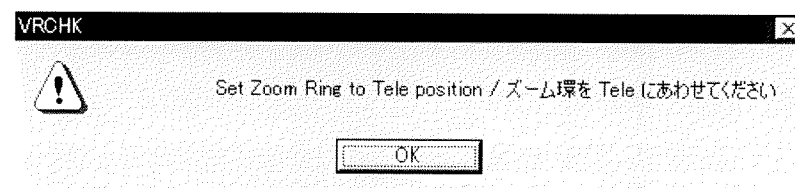
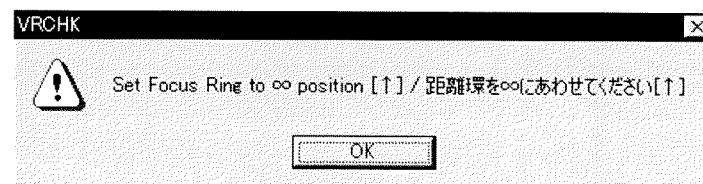
- 3 . Align the lens retainer to the end of the lens and then fix the lens retainer by tightening the clamp knob.



- ④ Turn on the VR lens adjustment equipment (J15380) and run the adjustment software.
- ⑤ Move the cursor to [AF80-400/4.5-5.6D VR] in the Lens Selection window and click it.



※ If the messages like pictures below are shown, set the focus ring and the zoom ring again referring to [Procedure to mount the lens] in the previous page and then click the [OK] button.

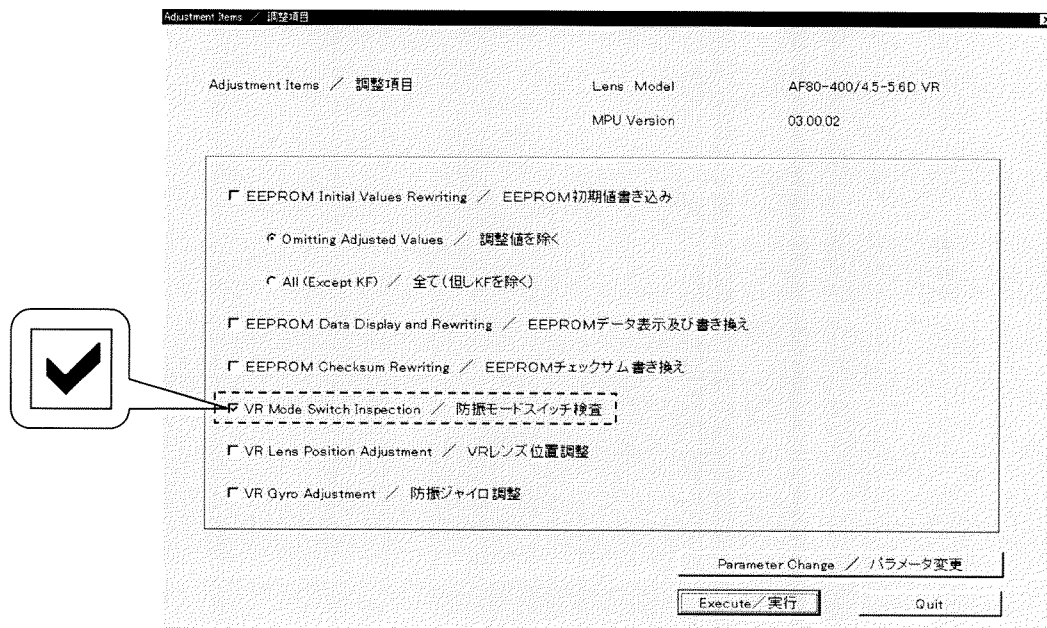


Notes : Do not change the lens settings (focus ring , zoom ring) until the adjustment is finished and it goes back to the Lens Selection window.

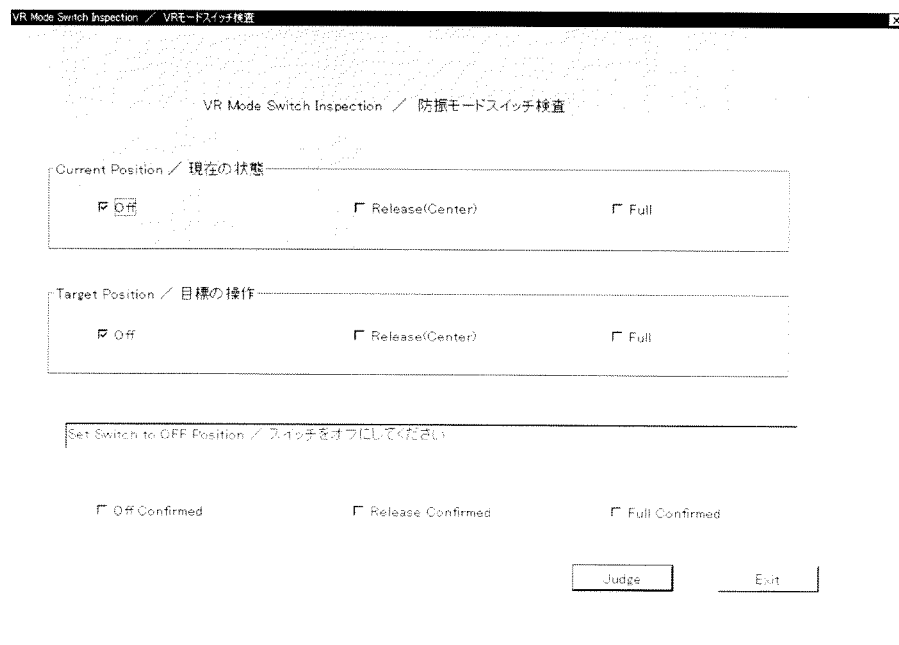
If the setting position changes in the middle of the adjustment, the correct adjustment value cannot be obtained.

## VIBRATION REDUCTION MODE SW INSPECTION

- ① Move the cursor to a box in front of the [VR Mode Switch Inspection] and click to mark the check marking.
- ② Move the cursor to the Execute button and click it.

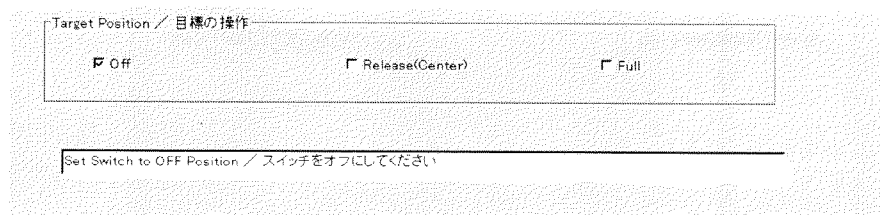


- ③ VR Mode Switch Inspection window is shown.



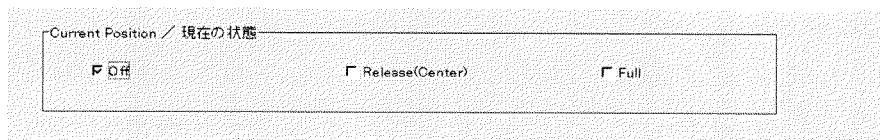


④ Target position of the mode switch is indicated.

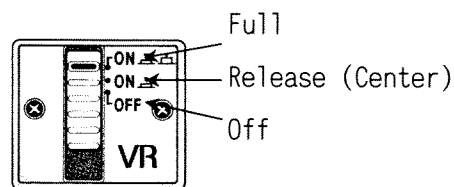


⑤ Set the mode switch to the designated position.

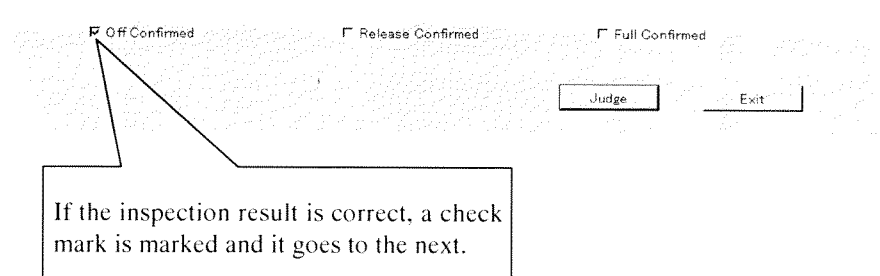
(If changing the switch, the present position is shown at the real time.)



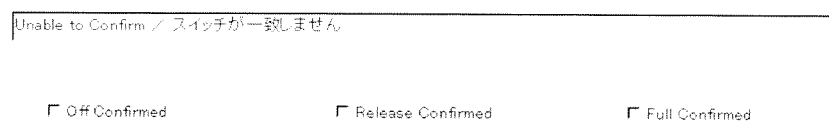
・ Mode switch



⑥ Move the cursor to the [Judge] button and click it.



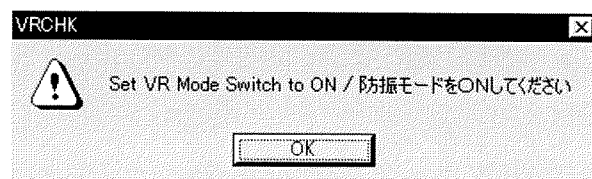
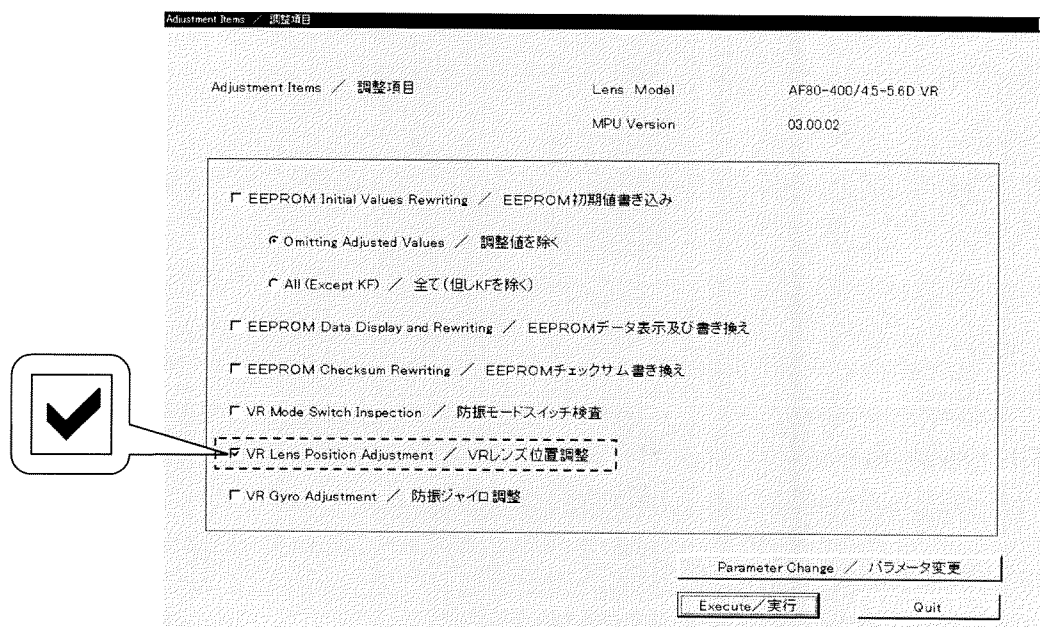
**Notes :** If the inspection result is not correct, the message like below is shown and it cannot go to the next.  
Set the switch and inspect it again.



⑦ When finishing the all inspection of 3 location of the mode switch, move the cursor to the [Exit] button and click it to evacuate from the inspection window.

## VR LENS POSITION ADJUSTMENT

- ① Move the cursor to a box in front of the [VR Lens Position Adjustment] and click it to mark the check marking.
- ② Move the cursor to the Execute button and click it.

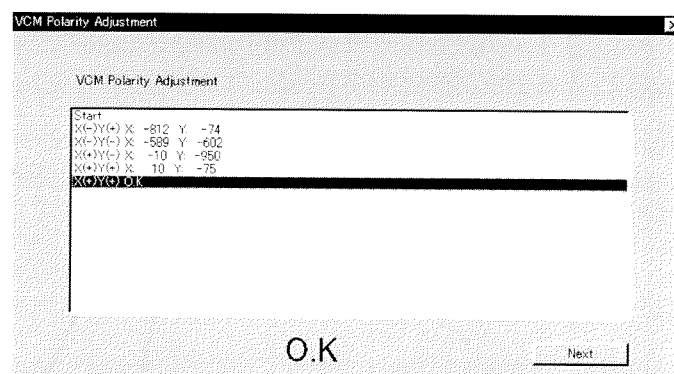


- ③ The message like a picture on the left is shown.

Set the VR mode switch of the lens to ON (Full or Release), and then move the cursor to the OK button and click it.

• VCM Polarity Adjustment (Controlled automatically)

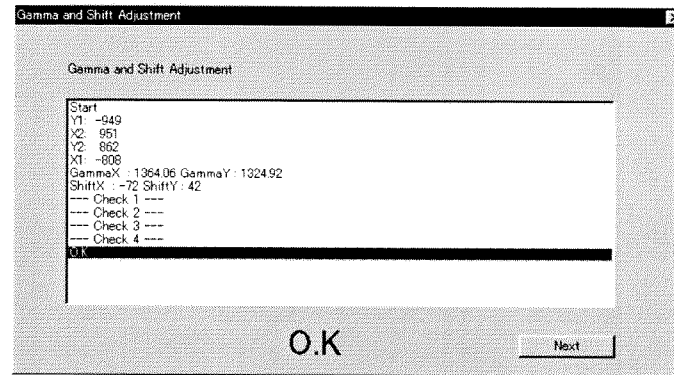
Detect the polarity of the VCM (Voice Coil Motor) and write it in EEPROM as the compensation value.



When [OK] is shown on the window, move the cursor to the Next button and click it.

• **Gamma and Shift Adjustment (Controlled automatically)**

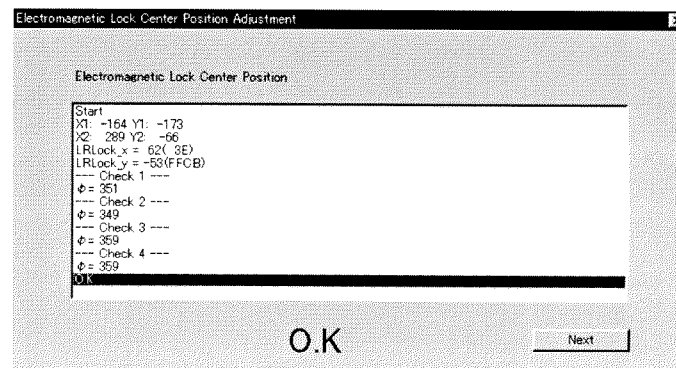
Adjust the inclination and control center position on the basis of the position sensor output in the VR unit.



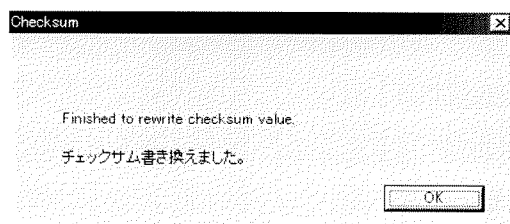
When [OK] is shown on the window, move the cursor to the Next button and click it.

• **Electromagnetic Lock Center Position Adjustment (Controlled automatically)**

Adjust the electromagnetic lock center position.



When [OK] is shown on the window, move the cursor to the Next button and click it.



• When the message that says rewriting the checksum is finished is shown, click the [OK] button.

Then set the VR mode to OFF according to the message and click the OK button to evacuate from the adjustment window.

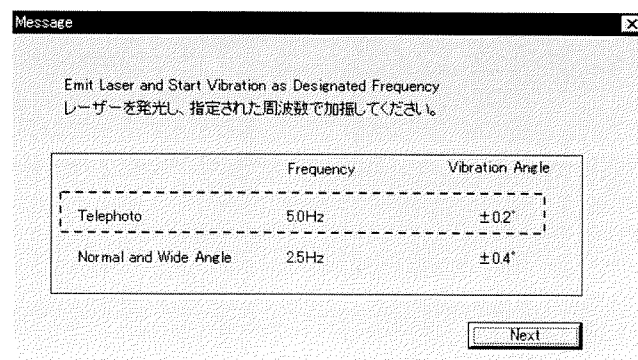
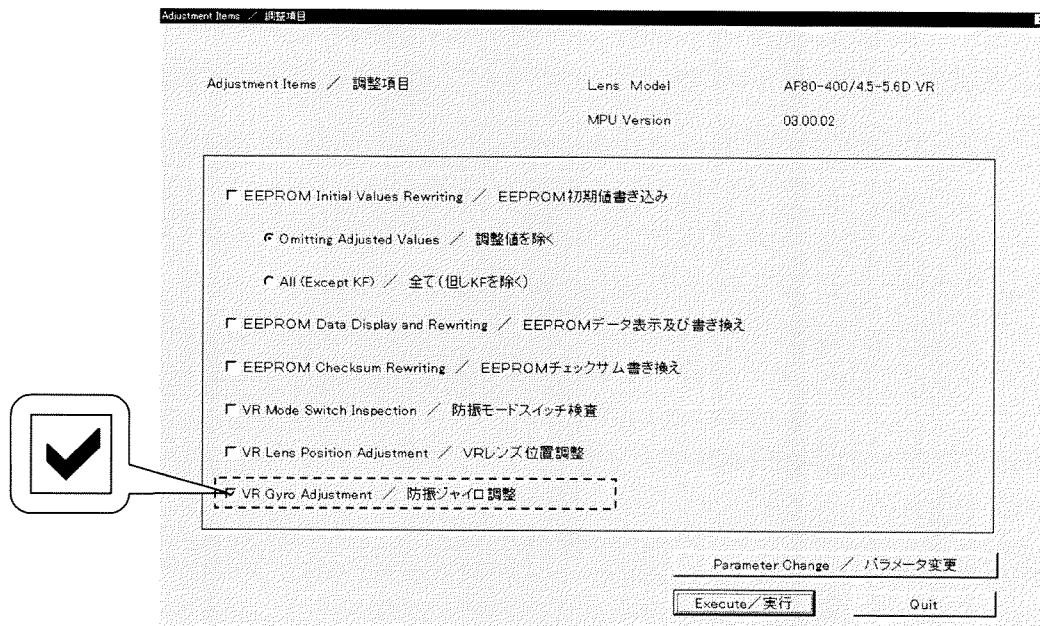
**Notes :**

If [NG] is shown in the middle of the adjustment, click the Next button. This makes it possible to evacuate from the inspection mode and to go back to the Lens Selection window after rewriting the checksum value. Then adjust it again.

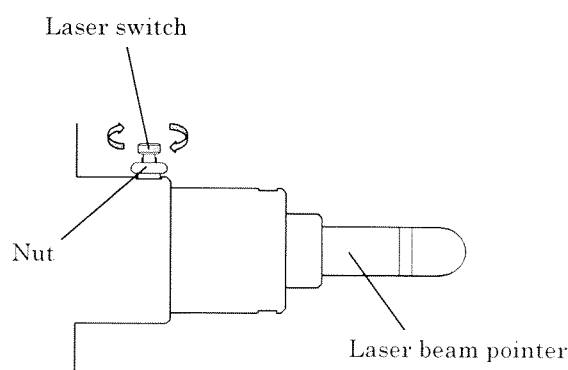
If it becomes be [NG] even performing the adjustment a few times, the VR unit, the gyro PCB or the main FPC might be defective.

VR GYRO ADJUSTMENT

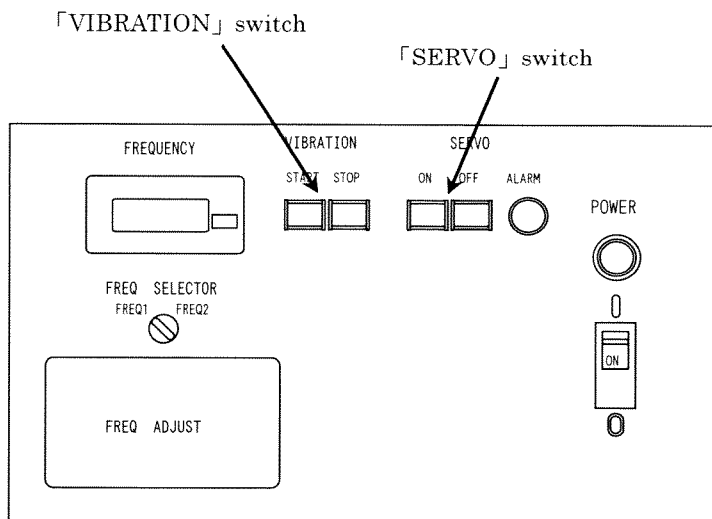
- ① Move the cursor to a box in front of [VR Gyro Adjustment] and click it to mark the check marking.
- ② Move the cursor to the Execute button and click it.



- ③ The message like a picture on the left is shown. Set it to the Telephoto settings.

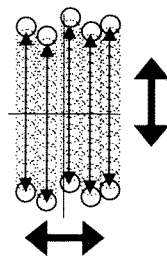
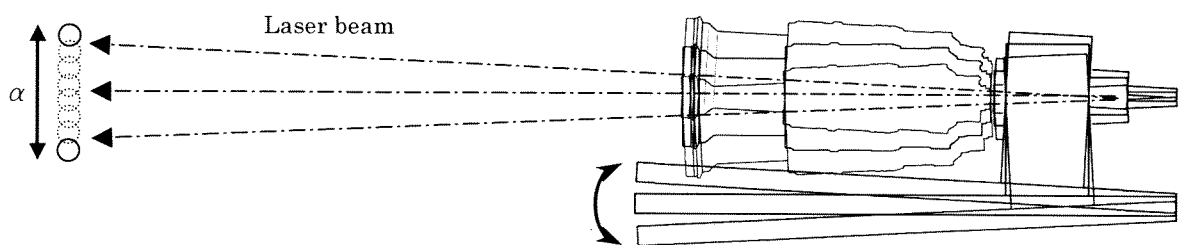


- ④ Loosen the nut of the laser switch of the VR lens adjustment equipment (J15380) and rotate the screw in an arrow direction to give the laser.



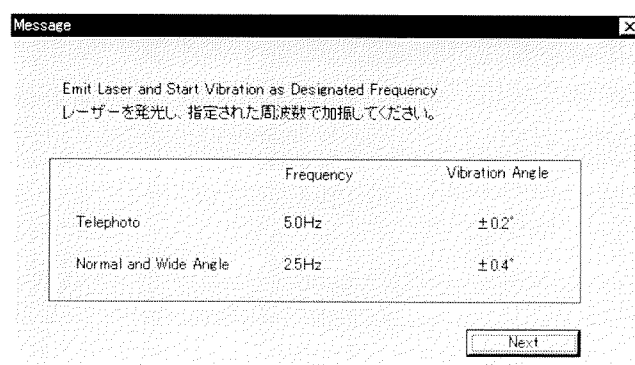
⑤ Press the SERVO [ON] button and the VIBRATION [START] button of the VR lens adjustment equipment (J15380).

⑥ With the equipment starts to vibrate, measure the length of the vibration width  $\alpha$  of the laser beam.



**Notes :** The phenomenon that the laser spot light shakes up and down, right and left occurs during measuring the vibration width.

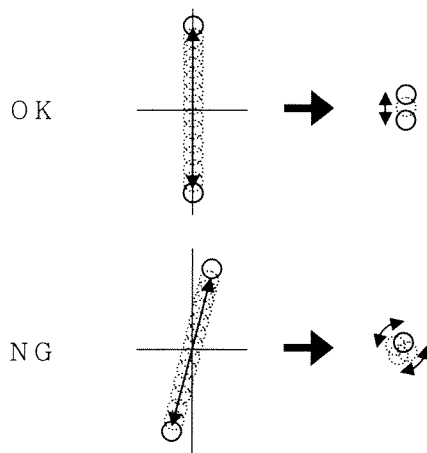
This is the motion of the VR unit control and is not defective.



⑦ Move the cursor to the Next button in the message box on the screen and click it.

Vibration reduction function starts to perform and the vibration width of the laser beam becomes be narrow.

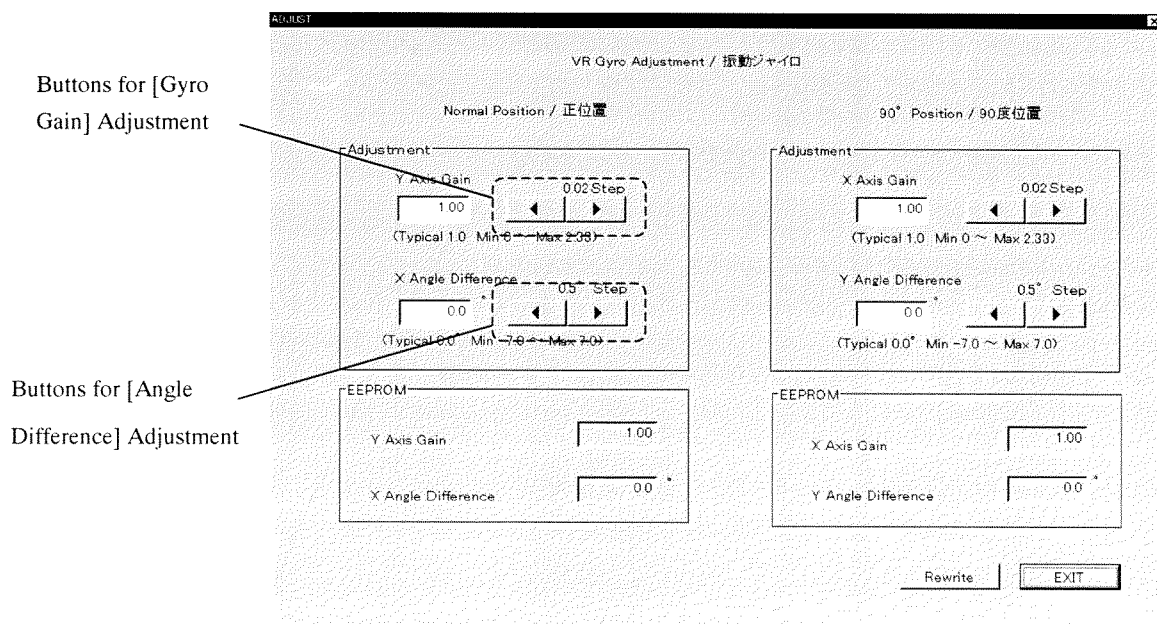
## • Angle Difference Adjustment



If there is angle difference, the laser beam source becomes be whether if it rotates round even performing the Gyro Gain Adjustment.

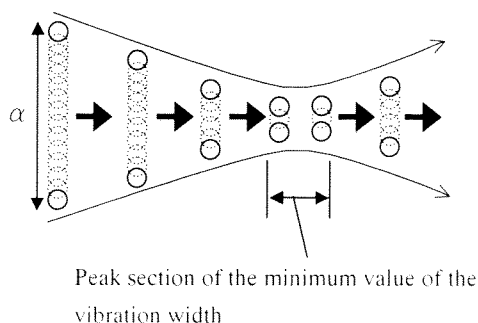
If it is possible to confirm the angle difference, adjust it by the buttons for the angle difference adjustment.

**Notes :** After operating the adjustment button, wait for a few seconds until a vibration motion is stabilized.



## • Gyro Gain Adjustment

Adjust the vibration width by the button for Gyro Gain Adjustment so that the length of the vibration width becomes be less than 1/5 of the measured laser vibration width  $\alpha$ .

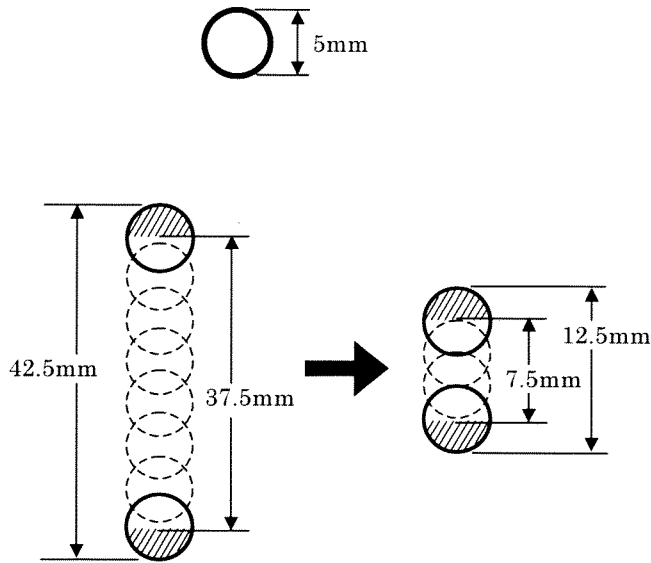


Standard: Less than 1/5 of the vibration width  $\alpha$

**Notes :** The laser beam vibrates widely again after it passes the peak section of the minimum value.

《Reference》

- The laser spot beam is irradiated about 5mm in diameter at 5 m ahead.



①To adjust the vibration width at the center of the laser spot beam, measure the whole vibration width first.

②Subtract the radius of the laser spot (oblique lined part) from the top and bottom of the measured vibration width.

Example)

When the whole vibration width is [About 42.5mm], the center vibration width becomes be  $42.5 - (2.5 + 2.5) = 37.5\text{mm}$ .

Standard after the gyro gain adjustment

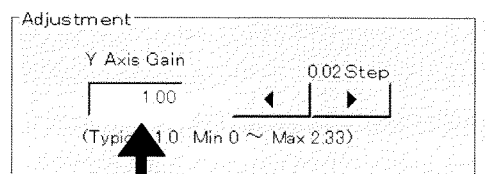
$37.5 \times 1/5 = 7.5\text{mm}$  (Center vibration width)

Whole vibration width becomes be

$7.5 + (2.5 + 2.5) = 12.5\text{mm}$ .

- How to obtain the minimum value of the vibration width

- ①Measure the vibration width while changing the adjustment value that is set every 0.02Step as shown below.
- ②The peak section of the minimum vibration width can be obtained by the actual measured value.
- ③Take the center of the peak section as the adjustment value.



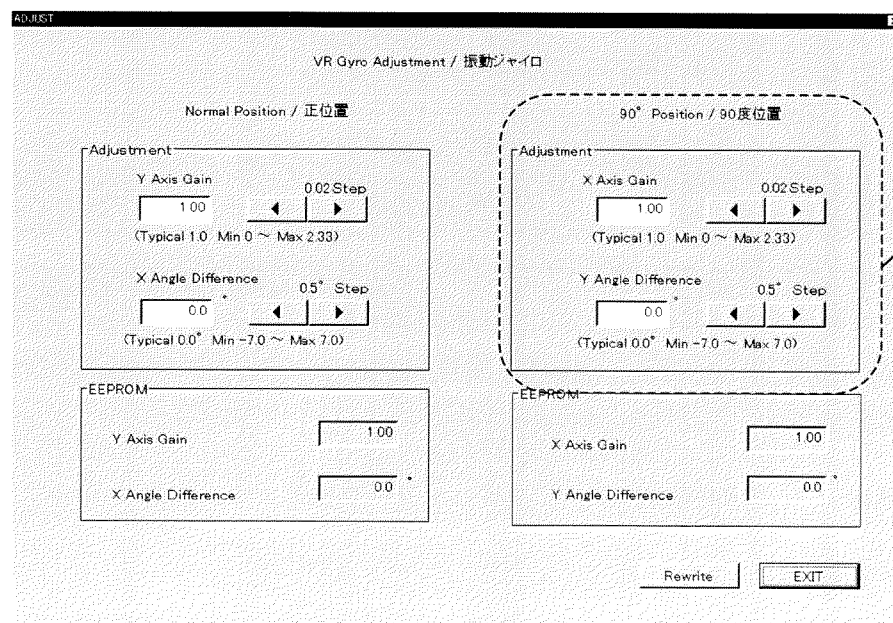
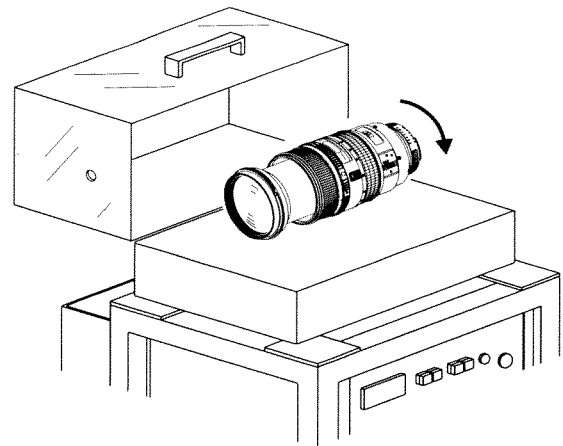
Gyro Gain Adjustment Value	Vibration width Actual measured value
•	•
•	•
0.90	14.5 mm
0.92	14.0 mm
0.94	13.5 mm
0.96	13.0 mm
0.98	12.5 mm
1.00	12.5 mm
1.02	12.5 mm
1.04	13.0 mm
1.06	13.5 mm
1.08	14.0 mm
1.10	14.5 mm
•	•
•	•

Peak section of the minimum value of the vibration width

Notes : When measuring the vibration width, read it in unit of 0.5mm.

- Rotate the lens 90 ° in an arrow direction and then adjust the angle difference and the gyro gain.

**Notes :** When adjusting the lens at 90 ° position, adjust it by the buttons for the adjustment at 90 ° position as shown in Figure below.



Buttons for adjustment  
at 90 ° position

- After the adjustment, click the [Rewrite] button to write the adjustment value in EEPROM in the lens.
- Then, click the [EXIT] button to evacuate from the adjustment mode.

**Notes :** If clicking [EXIT] button after not clicking the [Rewrite] button, the adjustment value is not stored and the adjustment is not influenced.

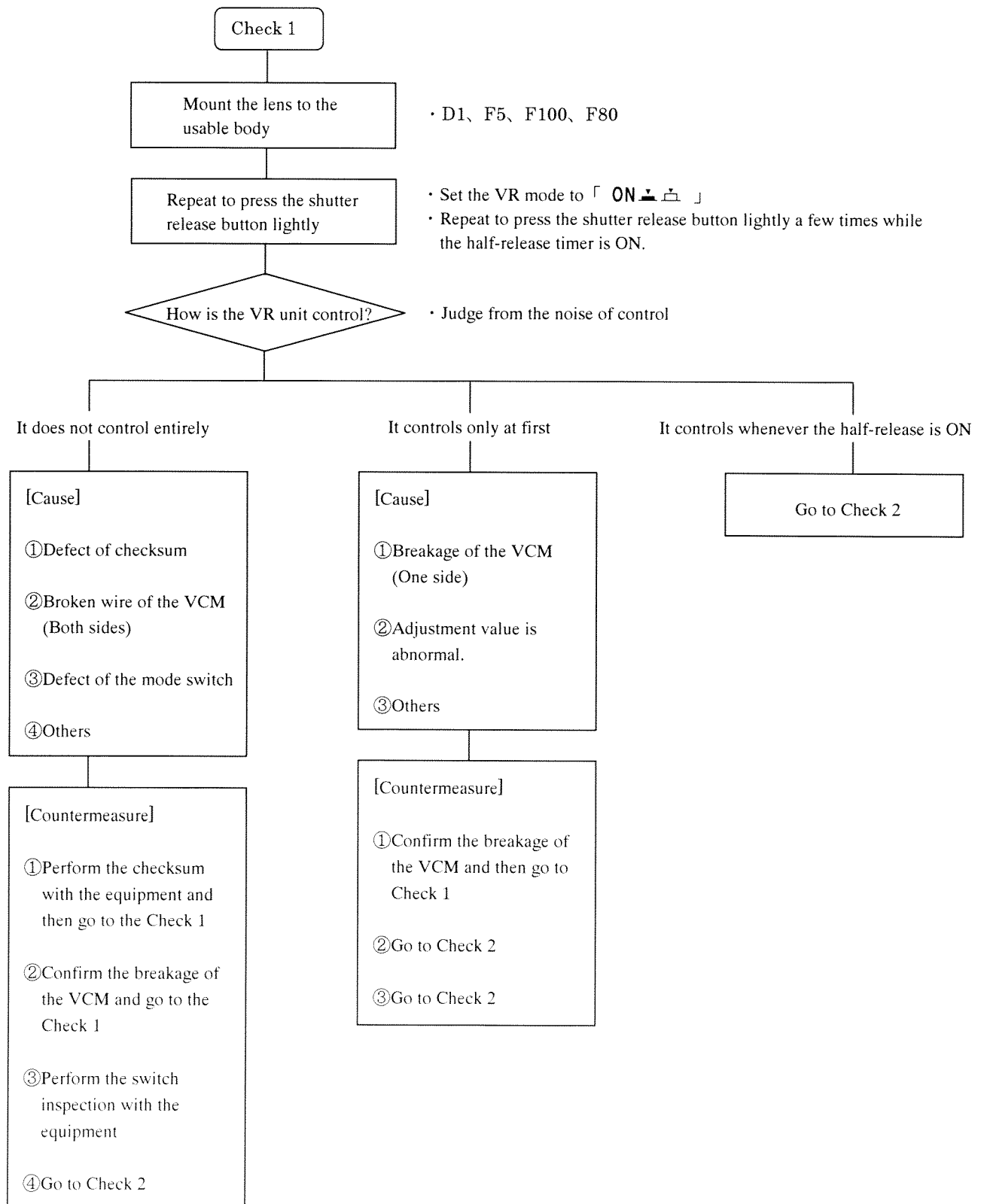
- Click the [Quit] button at the Adjustment Items window to go back to the Lens Selection window.

**Notes :** Do not remove the lens or turn OFF the VR lens adjustment equipment until it goes back to the Lens Selection window. The trouble that the adjustment value is not stored correctly, etc. occurs since the communication is cut off.

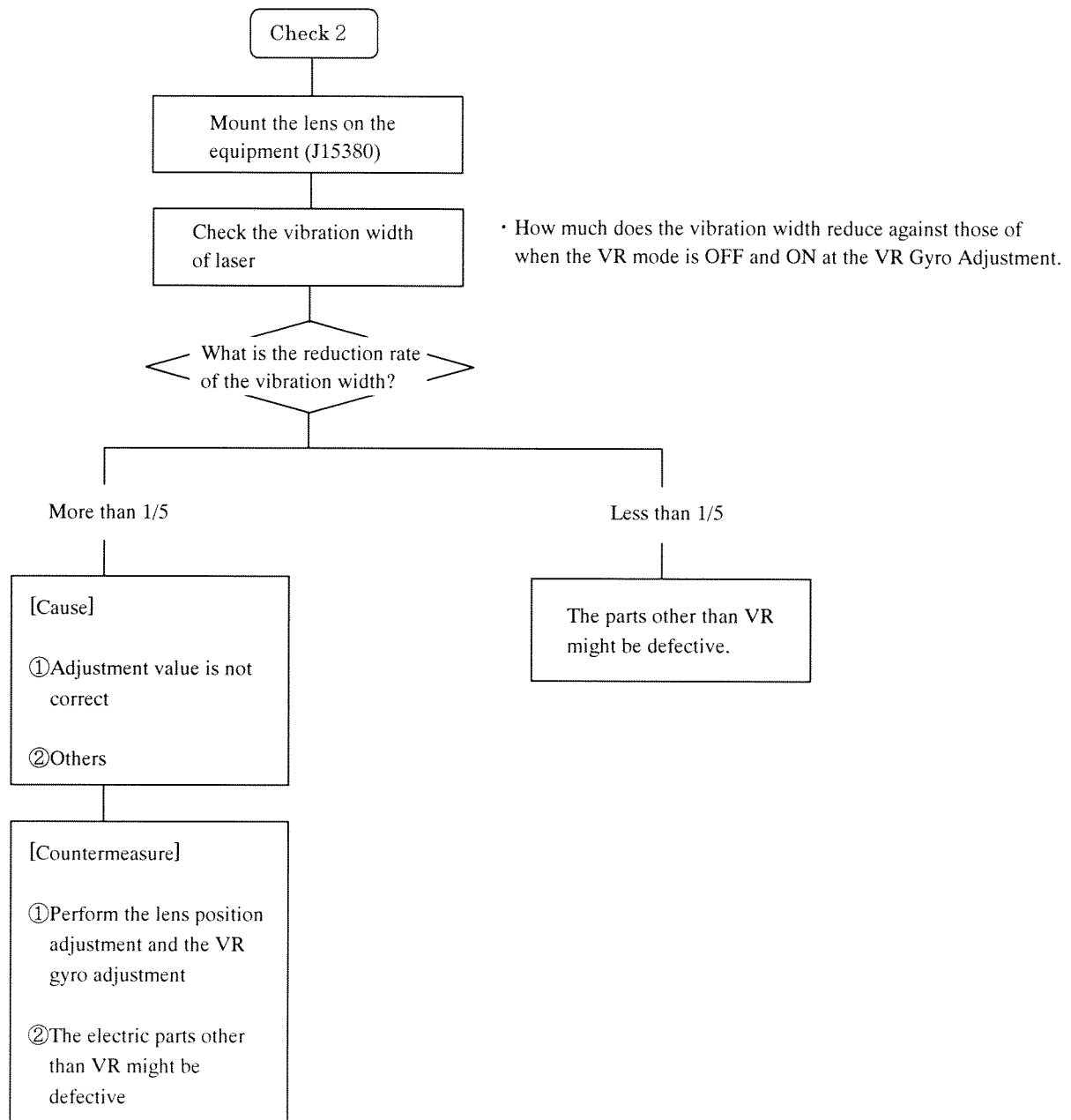


STANDARD TO JUDGE THE VR PERFORMANCE

Please refer to the following chart before performing the VR adjustment for the product of which VR is defective with the equipment.



Go on the next page [Check 2]



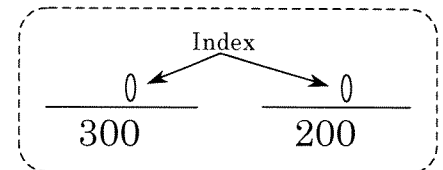
INSPECTION OF ENCODER SIGNAL

※Use an F70(N70)camera body and AF .nikkor lens inspection program for F70/N70 to display encoder signal on the computer monitor when making an inspection.

Inspection method

- Start the AF nikkor lens inspection program for F70/N70 and select “1. READING OF LENS ENCODER SIGNAL” . Make inspection according to instructions as shown on the display.
- Encoder signals should be as described in the table below when the zoom and distance scale are set to specified positions.

Notes : For some reasons of its specification, set 200mm and 300mm of the zoom ring to the position shown in figure on the right, not set them to the center of the scale



MF, VR mode OFF

<div>Zoom position</div> <div>Distance scale position</div>	f = 8 0 mm			f = 2 0 0 mm			f = 3 0 0 mm			f = 4 0 0 mm		
	Encoder signal											
	1	2	3	1	2	3	1	2	3	1	2	3
∞	5Ah	63h	F5h	5Ah	A7h	F5h	5Ah	FDh	F5h	5Ah	5Eh	F5h
4 m										0Fh	5Eh	F5h
Most close distance position										F7h	5Eh	F5h

AF, VR mode OFF

<div>Zoom position</div> <div>Distance scale position</div>	f = 8 0 mm			f = 2 0 0 mm			f = 3 0 0 mm			f = 4 0 0 mm		
	Encoder signal											
	1	2	3	1	2	3	1	2	3	1	2	3
∞	5Ah	63h	5Dh									

AF, VR mode ( ON )

<div>Zoom position</div> <div>Distance scale position</div>	f = 8 0 mm			f = 2 0 0 mm			f = 3 0 0 mm			f = 4 0 0 mm		
	Encoder signal											
	1	2	3	1	2	3	1	2	3	1	2	3
$\infty$	5Ah	63h	57h									

AF, VR mode ( ON )

<div>Zoom position</div> <div>Distance scale position</div>	f = 8 0 mm			f = 2 0 0 mm			f = 3 0 0 mm			f = 4 0 0 mm		
	Encoder signal											
	1	2	3	1	2	3	1	2	3	1	2	3
∞	5Ah	63h	77h									

◎If encoder signal values are different from those shown in the table, following causes must be considered.

Distance brush is mounted in the wrong position, distance brush or FPC is defective, encoder Patterns on the FPC are contaminated, or the FPC is fixed in the wrong position.

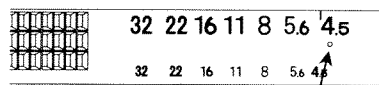
When replacing a part listed below,  
some adjustment may be required

Items of adjustment Parts replaced	VR adjustment	1st lens group inclination adjustment
Main FPC	○	○
VR unit	○ ※ 1	○
Gyro PCB	○ ※ 1	
1st lens group		○ ※ 2

※ 1 : Not only when replacing the part, but also when disassembling it, perform the adjustment.

※ 2 : Perform the adjustment only when replacing the part. Adjustment is not necessary when only disassembling it.

#### ATTACHING METER COUPLING SHOE



Make hole on this  
concave portion

①Take out aperture ring # 28.

②Make a hole ( $\phi 1.1$ ) at the concave portion of  
aperture ring.

Mount meter coupling shoe on the aperture ring  
and make another hole ( $\phi 1.1$ ) based on the hole  
of meter coupling shoe.

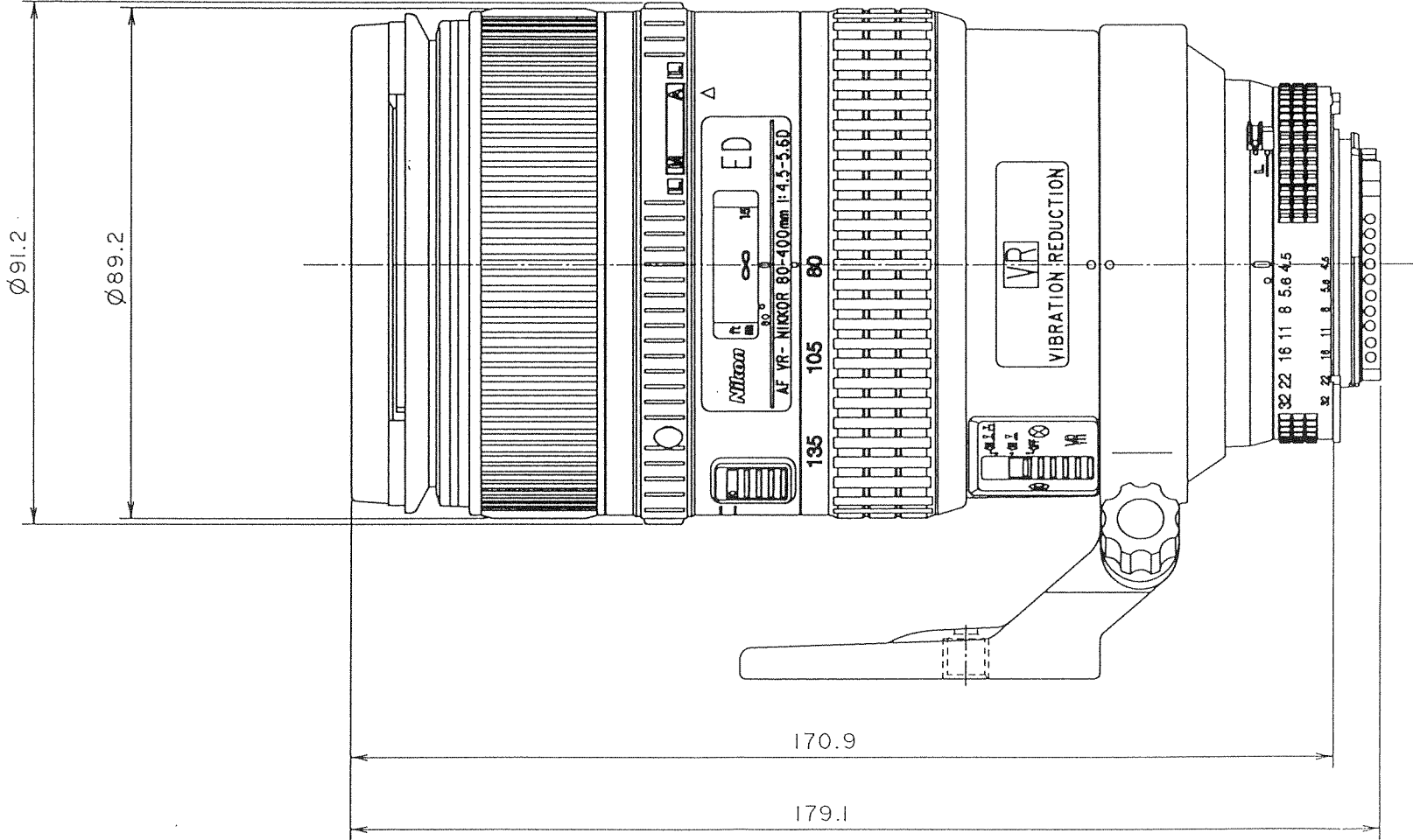
Meter coupling shoe	1K406-001	× 1
Screw	1K010-002-1	× 2

③Mount meter coupling shoe.

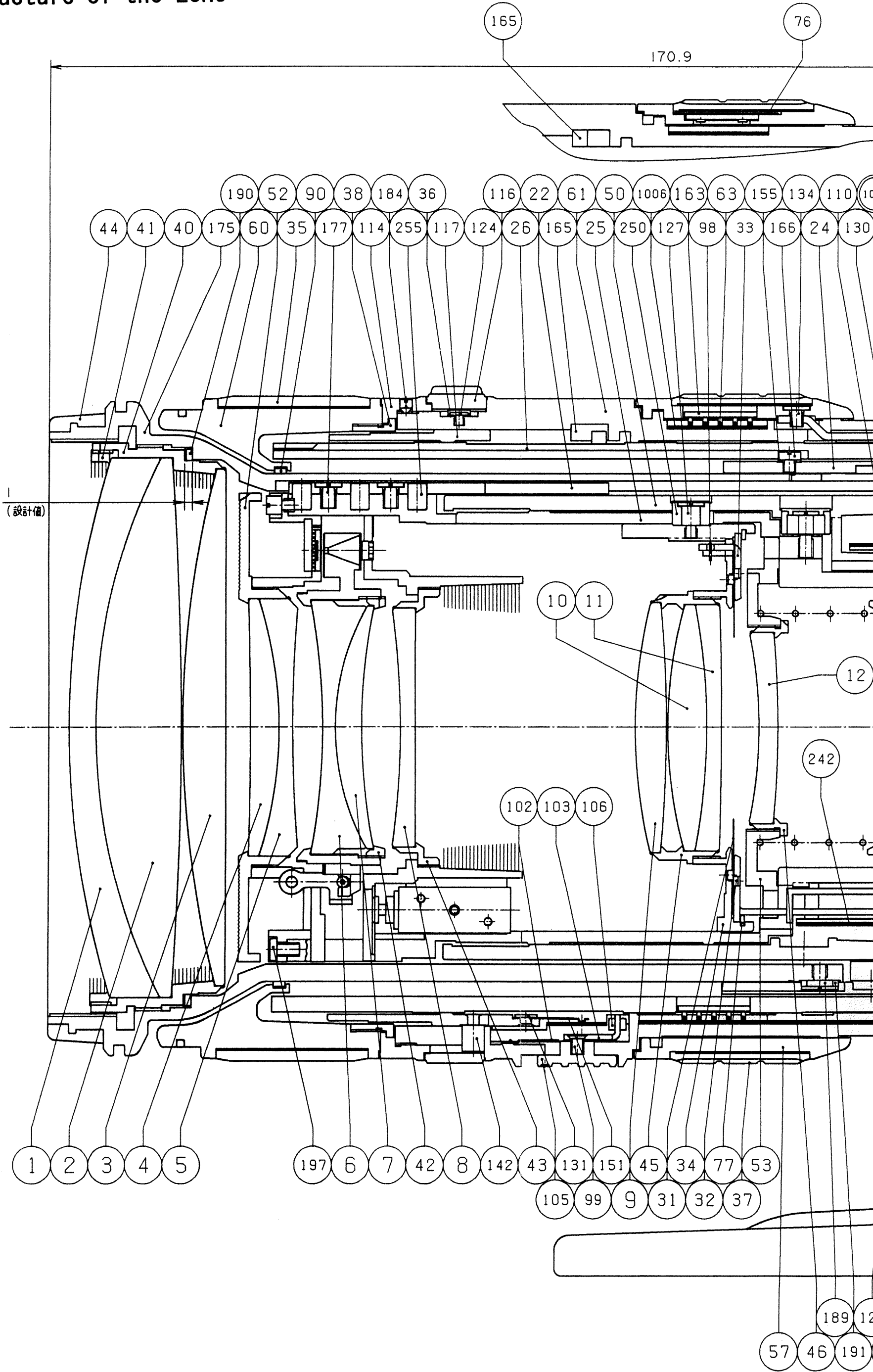
④Assembling.

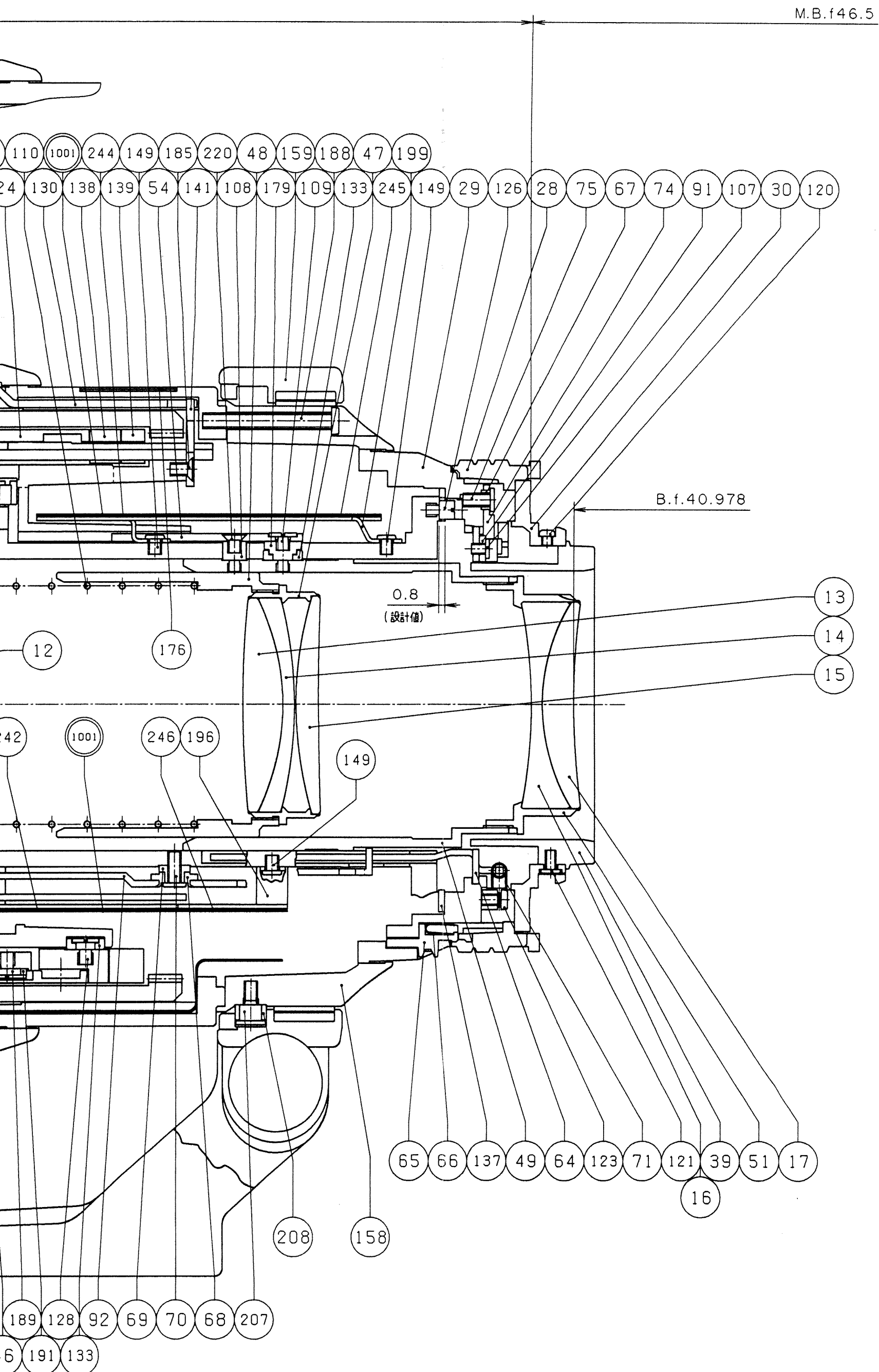
外觀図 Sketch drawings

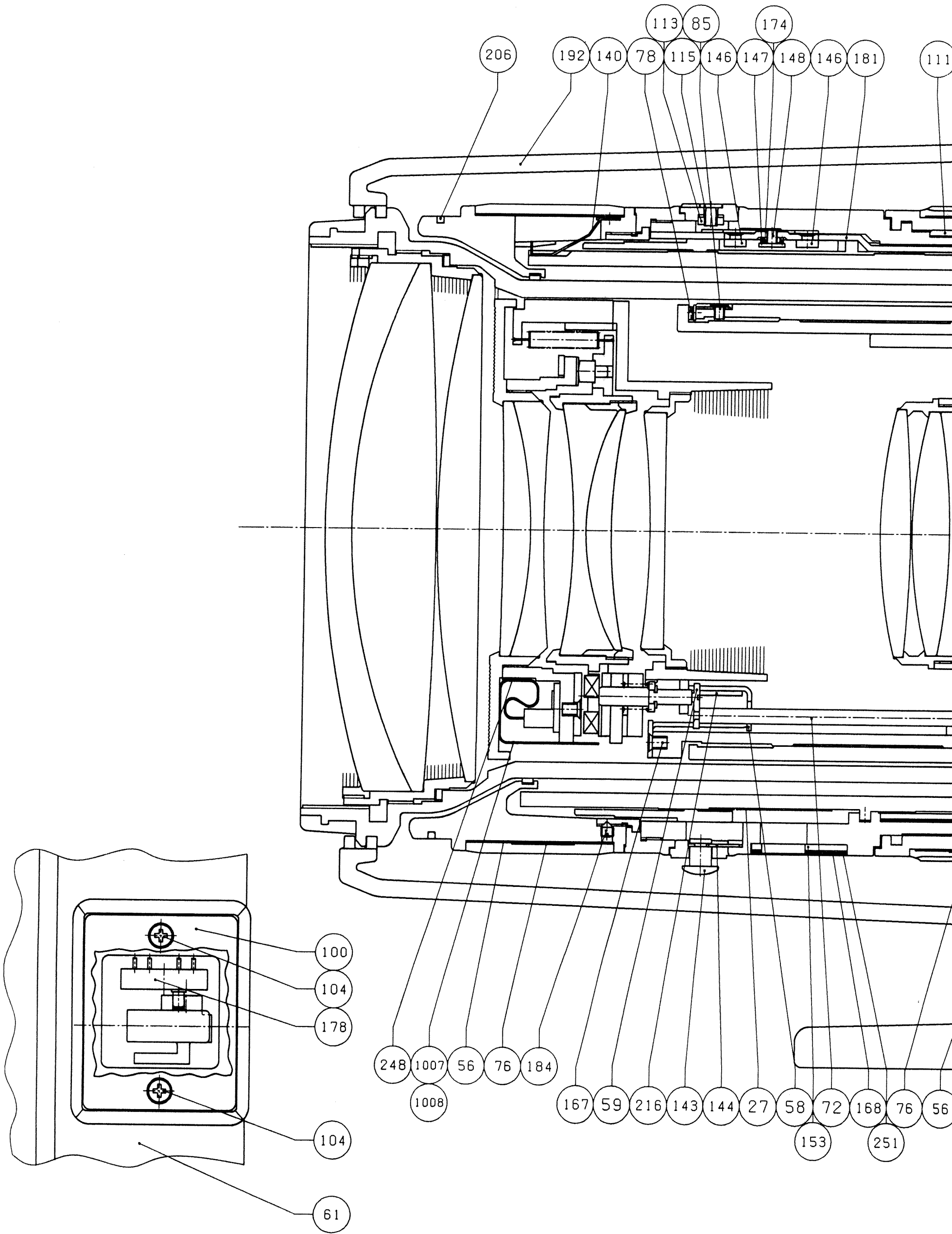
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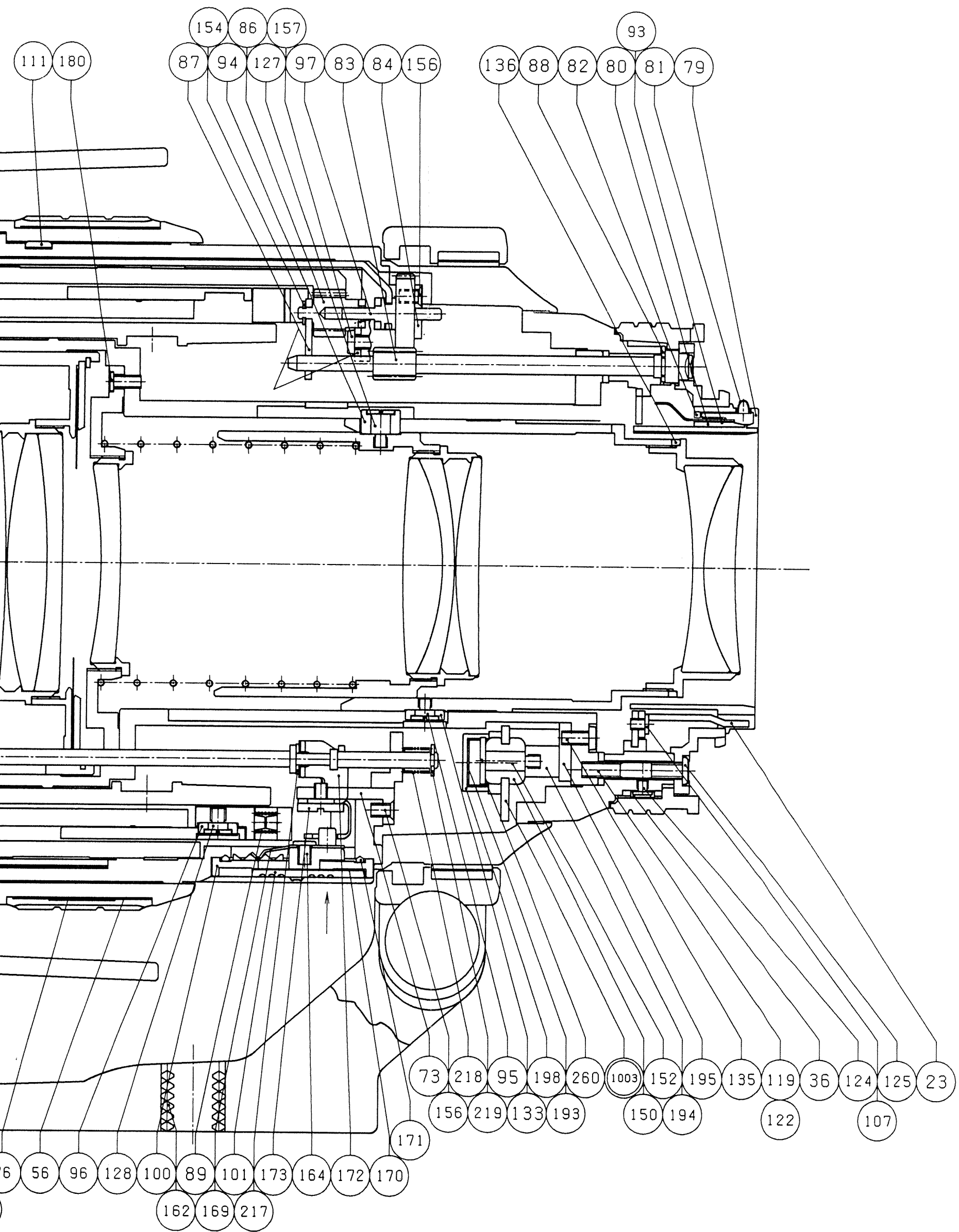
組立図 Structure of the Lens

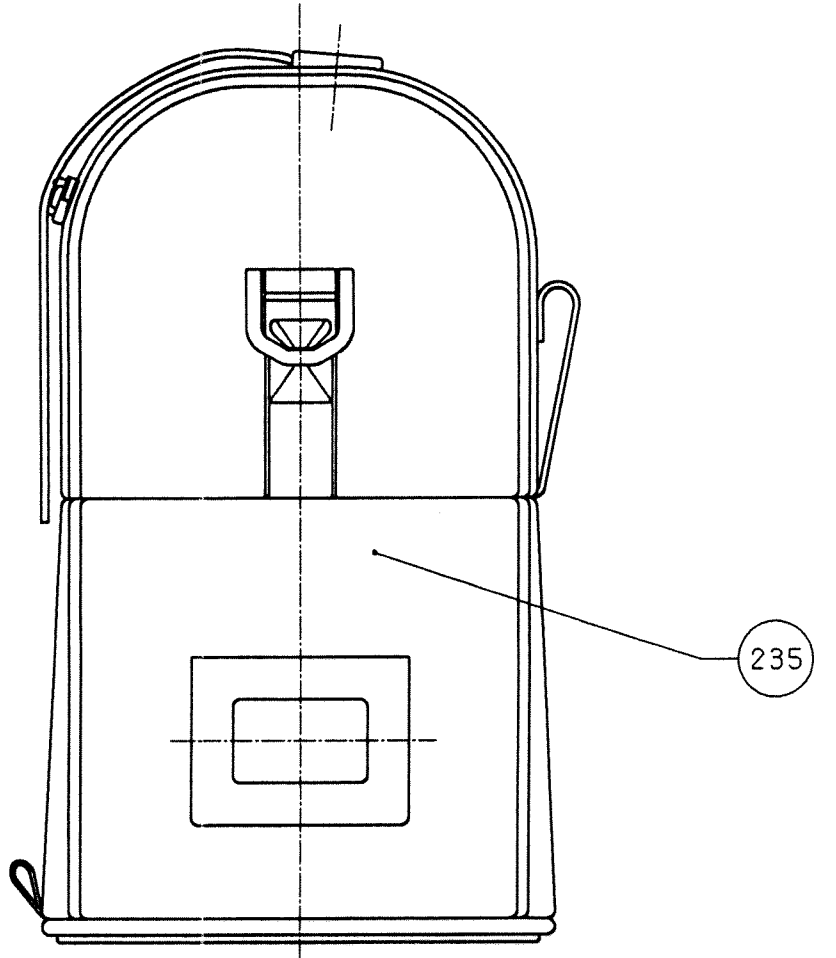
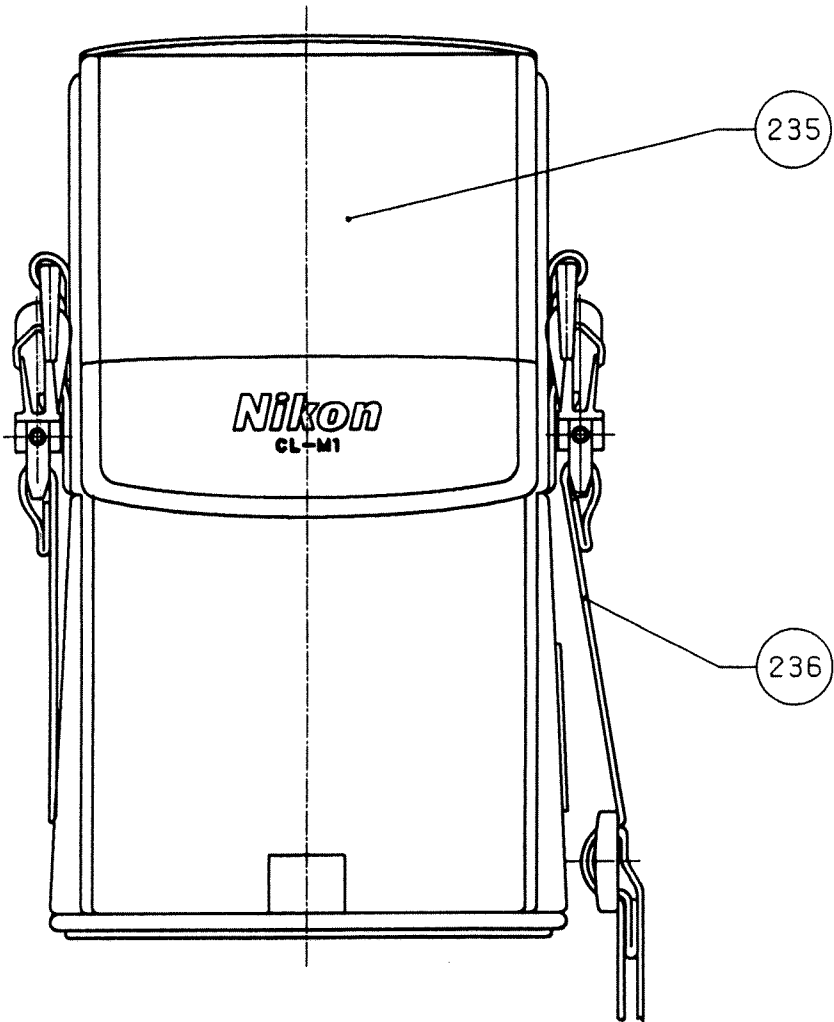
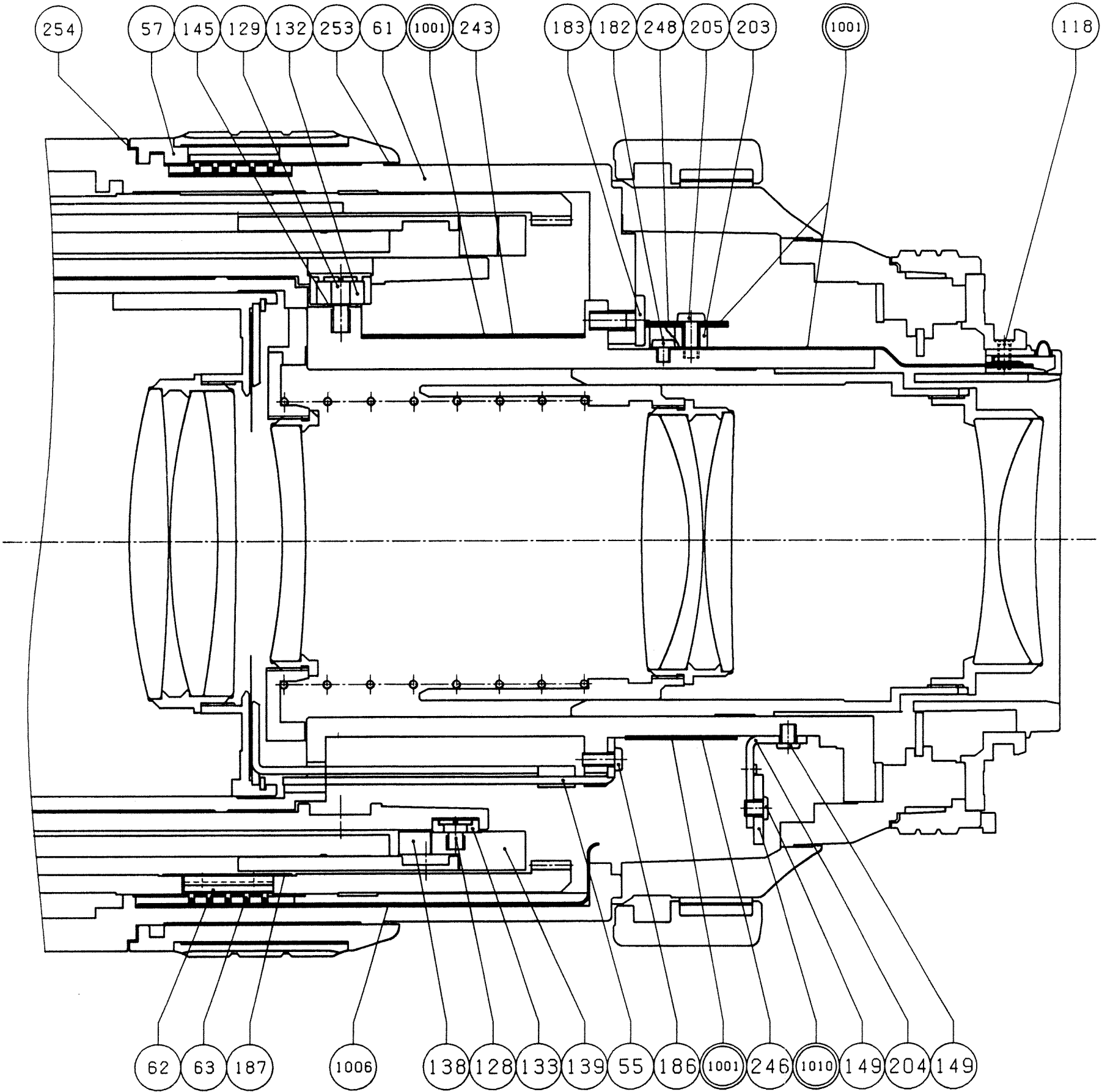


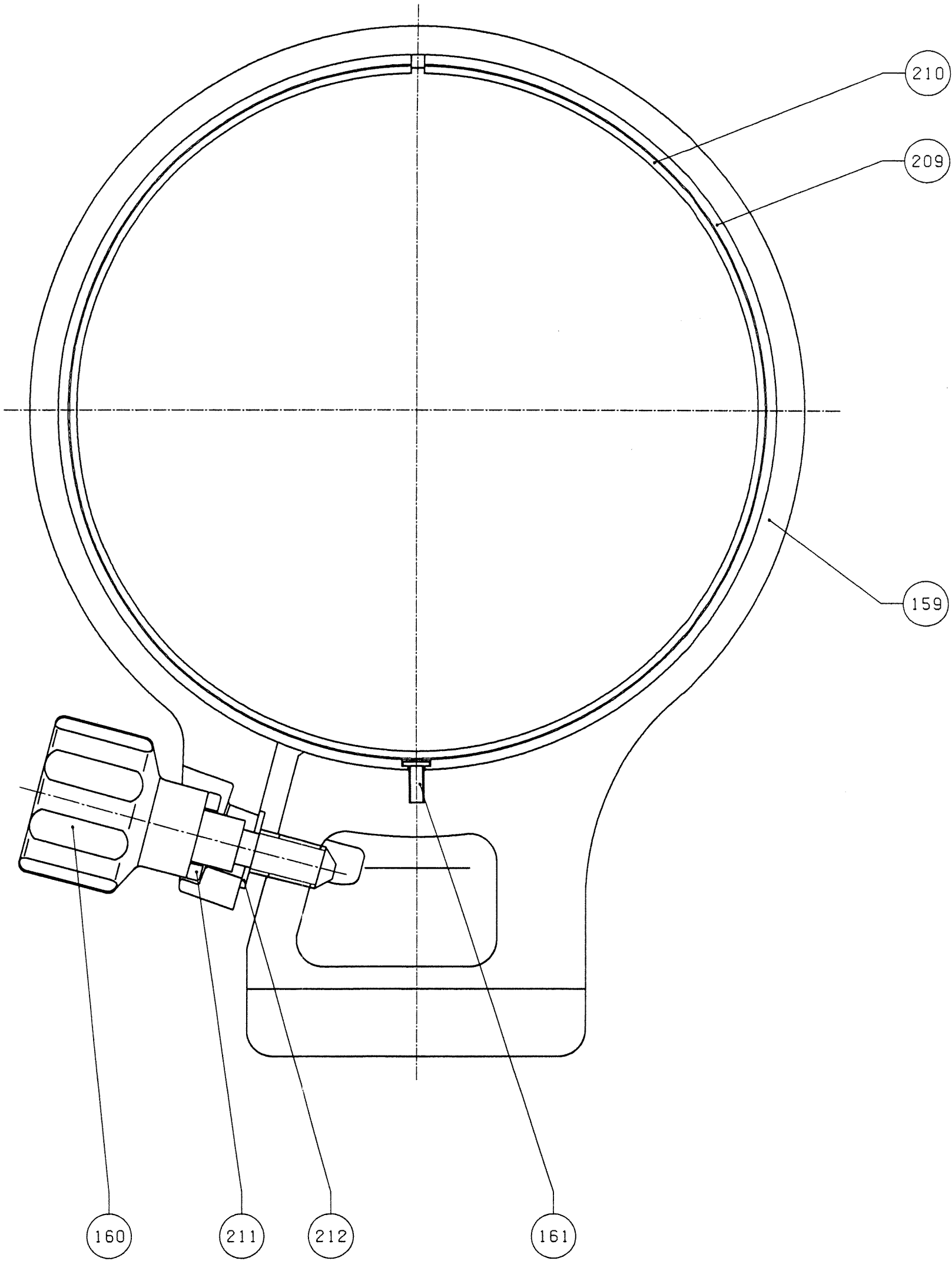


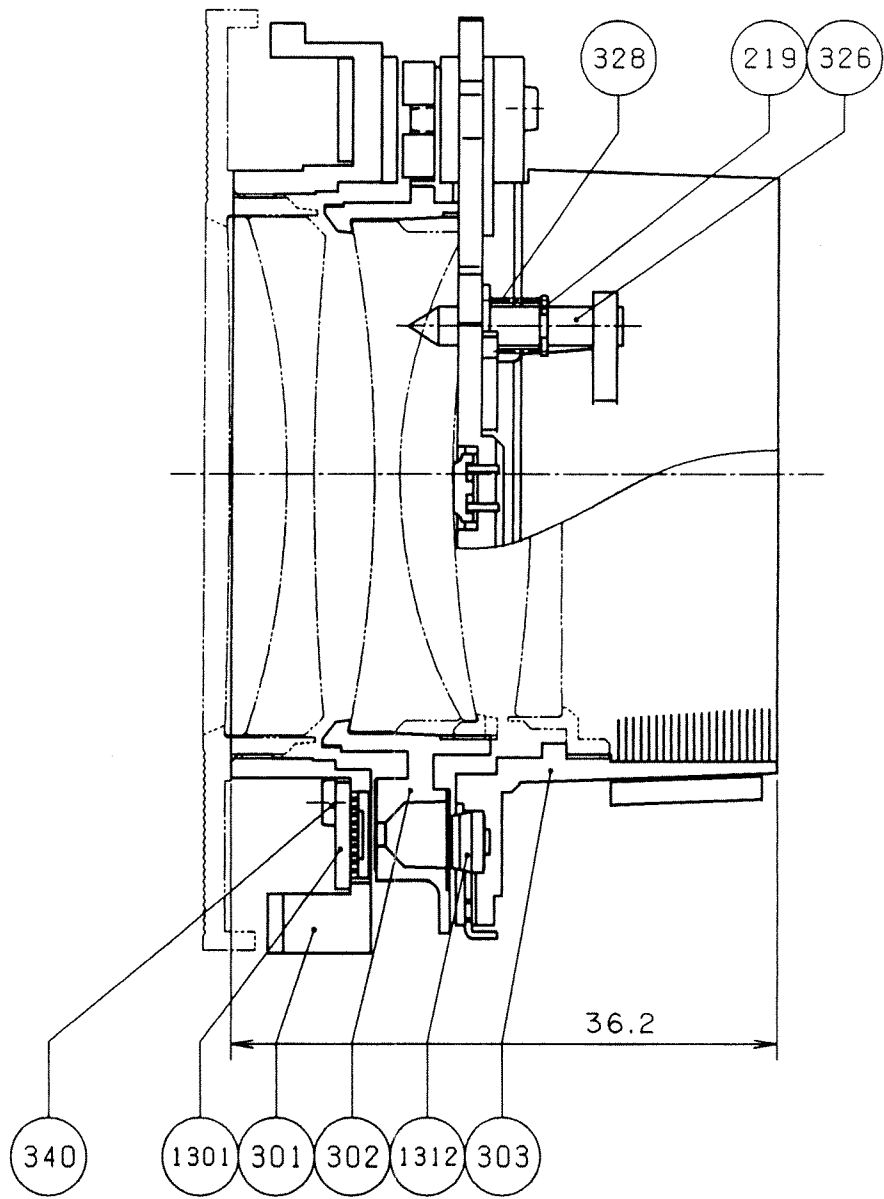
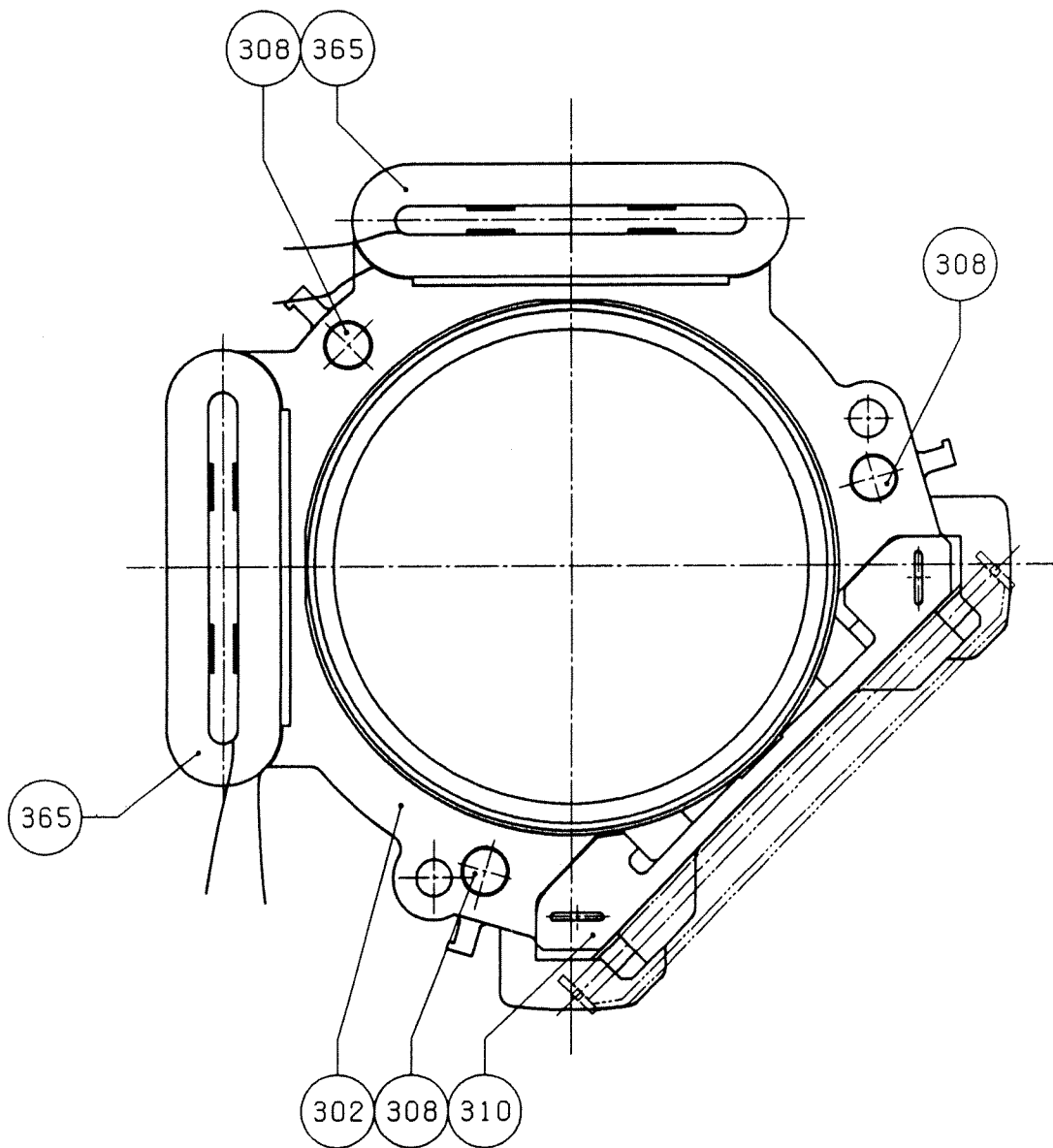




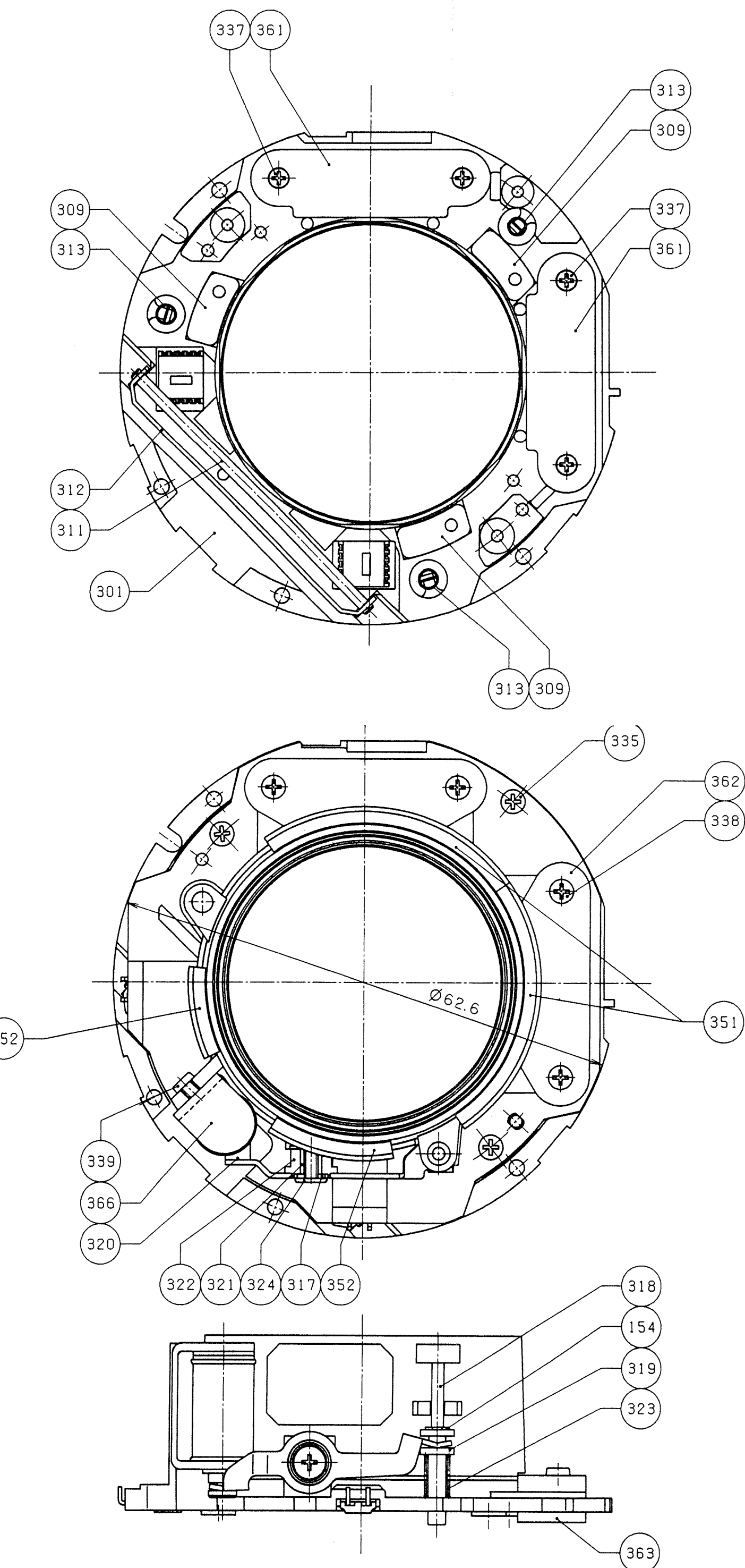




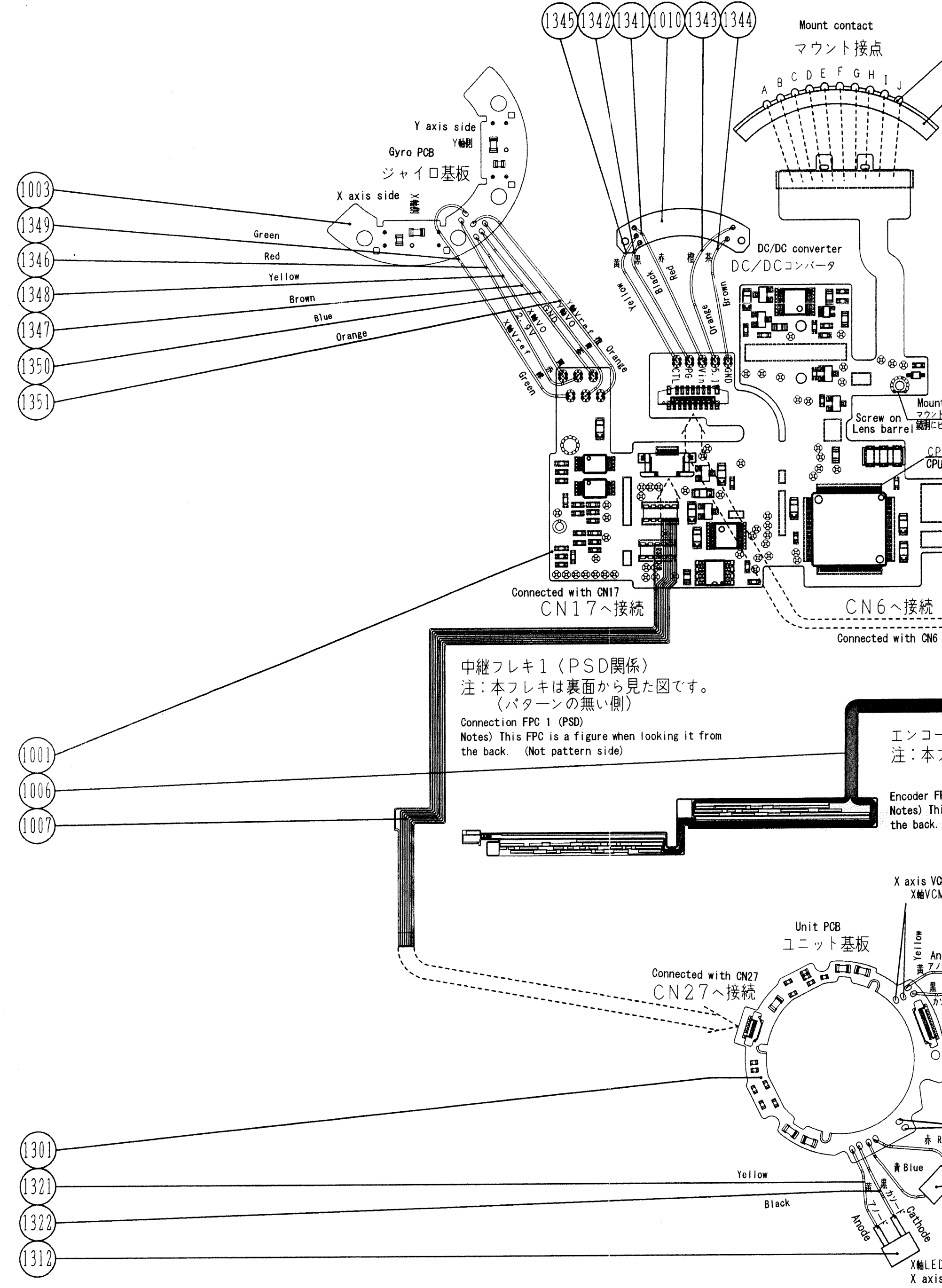


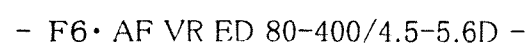


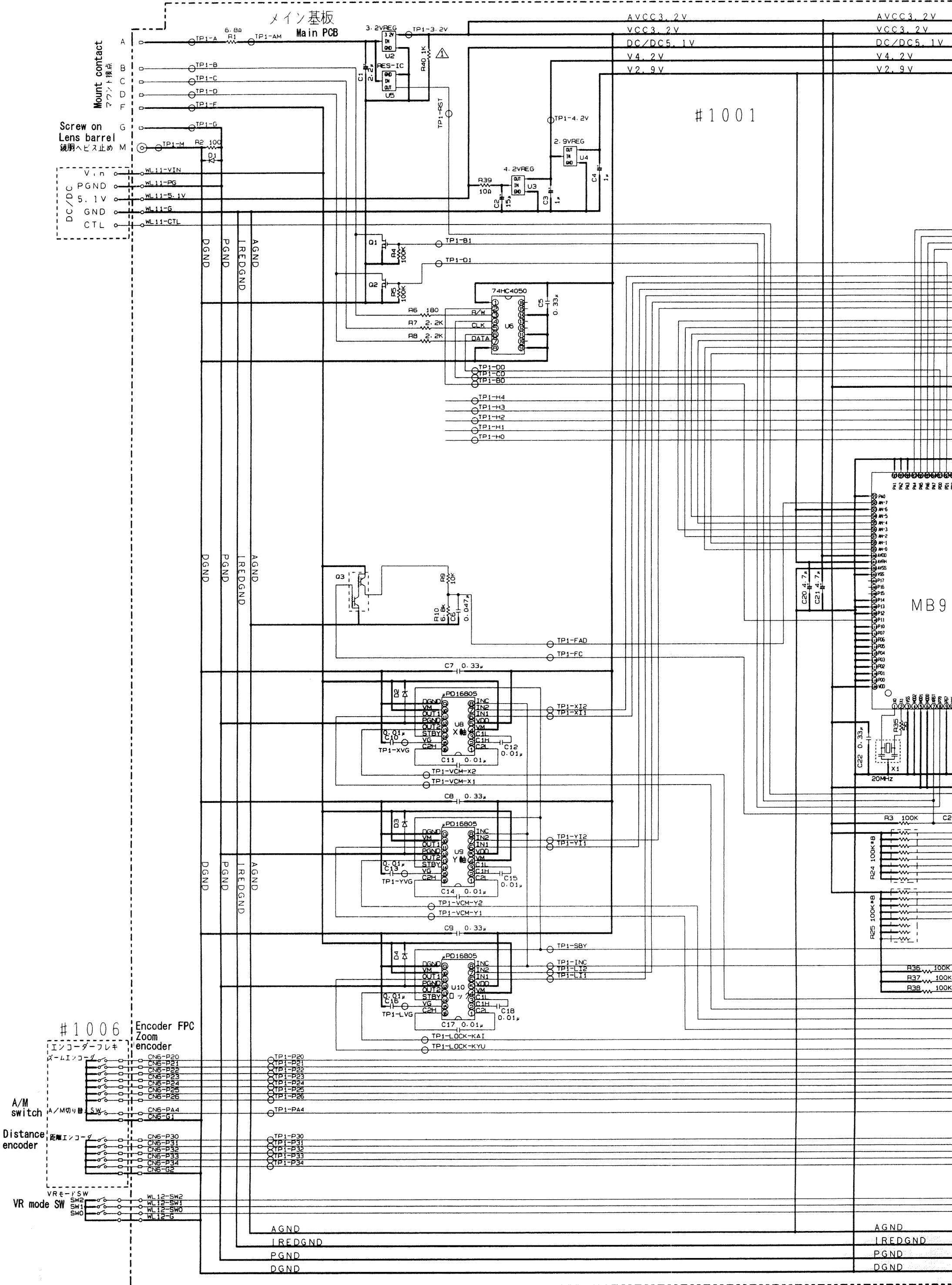
352



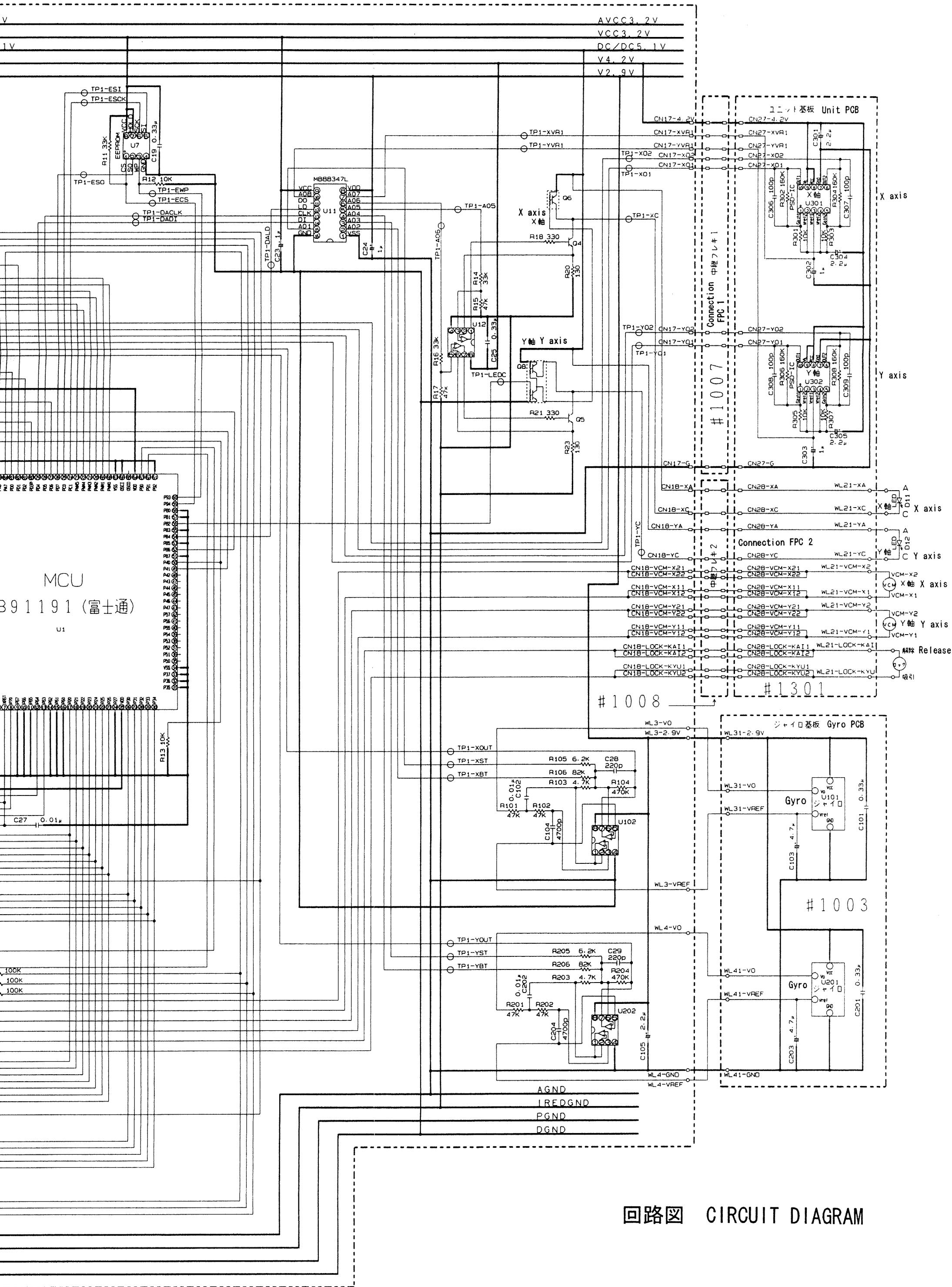
実体配線図 WIRING











回路図 CIRCUIT DIAGRAM